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A FIELD TEST OF LEAD-BASED PAINT TESTING TECHNOLOGIES:

DATA DOCUMENTATION

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CONTRIBUTING ORGANIZATIONS

The study described in this report was funded by the U.S. Environmental Protection Agency and the U.S. Department of Housing and Urban Development. The study was managed by the U.S. Environmental Protection Agency. The study was conducted collaboratively by two organizations under contract to the Environmental Protection Agency, Midwest Research Institute and QuanTech. Each organization's responsibilities are listed below.

Midwest Research Institute

Midwest Research Institute (MRI) was responsible for initiating the pilot study on schedule, for overall production of the Quality Assurance Project Plan for both the pilot and the full study, for providing input to the design of the study, for planning and supervising the field work, for collecting paint samples, for the laboratory analysis of paint chip samples, and for writing sections of the technical report.

QuanTech

QuanTech (formerly David C. Cox & Associates) was responsible for the design of the study and contributions to the Quality Assurance Project Plan for the pilot and full studies, for participation in field work, for data management and statistical analysis, and for overall production of the technical and summary reports.

U.S. Environmental Protection Agency

The U.S. Environmental Protection Agency (EPA) co-funded the study and was responsible for managing the study, for reviewing study documents, and for arranging for the peer review of the final report. The EPA Project Leader was John Schwemberger. The EPA Work Assignment Managers were John Scalera and John Schwemberger. The EPA Project Officers were Jill Hacker, Samuel Brown, and Janet Remmers. Cindy Stroup was the Branch Chief of the Technical Programs Branch and initiated this study.

U.S. Department of Housing and Development

The Department of Housing and Urban Development (HUD) co-funded the study and identified sources of housing for the study. Bill Wisner was the key HUD staff member.

ACKNOWLEDGMENTS

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EXECUTIVE SUMMARY

BACKGROUND

This study was undertaken by the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Housing and Urban Development (HUD) to collect information needed for the development of federal guidance on testing paint for lead. Prior to this study, lead testing information was inadequate as little formal evaluation had been done of the various field testing methodologies.

The impetus for this study came from the passage of Title X (Section 1017 of the Residential Lead-Based Paint Hazard Reduction Act of 1992), which mandated that the federal government establish guidelines for lead-based paint hazard evaluation and reduction. This study was designed to produce the type of detailed information EPA and HUD needed in order to respond to that mandate, and focused on two field technologies that are used for testing for lead in paint: portable X-ray fluorescence (XRF) instruments and chemical test kits. A pilot study was conducted during March and April 1993 in Louisville, Kentucky. The full study was conducted from July through October 1993 in Denver, Colorado and Philadelphia, Pennsylvania.

This is the data documentation report of the study. This report contains information about the data files and data records developed from the study data. Two other reports are available on the study. The report *A Field Test of Lead-Based Paint Testing Technologies: Summary Report* (EPA 747-R-95-002a) contains a summary of study procedures and results. This report can be requested by calling the National Lead Information Center at 1-800-424-LEAD. The report *A Field Test of Lead-Based Paint Testing Technologies: Technical Report* (EPA 747-R-95-002b) contains technical detail on study procedures and results. The technical report can ordered from the National Technical Information Service (NTIS) at 703-487-4650 (NTIS reference number: PB96-125026).

TECHNOLOGIES EVALUATED

This study evaluated XRF instruments and chemical test kits. XRF instruments measure lead in paint by directing high energy X-rays and gamma rays into the paint, causing the lead atoms in the paint to emit X-rays which are detected by the instrument and converted to a measurement of the amount of lead in the paint. Chemical test kits detect the presence of lead in paint by a chemical reaction that occurs when chemicals in the kit are exposed to lead. This reaction causes a color change to occur if lead is present in the paint.

Laboratory spectroscopic analysis of paint samples was conducted to determine the actual levels of lead in the paint. The laboratory results were used as a benchmark for comparison to the XRF and test kit results.

STUDY OBJECTIVES

The overall study goal was to collect information about field measurement methodologies sufficient to allow EPA and HUD to establish guidance and protocols for lead hazard identification and evaluation. In order to achieve that goal, the study had to be designed and conducted with sufficient rigor and appropriate quality assurance.

To ensure adequacy of the resulting data, six specific study objectives were developed: three primary and three secondary. The results are presented in this report in two ways: overall conclusions and testing recommendations are made in light of the overall study goal, and results are provided in terms of the specific study objectives.

The three primary study objectives were: (1) to characterize the performance (precision and accuracy) of portable XRF instruments under field conditions; (2) to evaluate the effect on XRF performance of interference from the material (the substrate) underlying the paint; and (3) to characterize the relationship between test kit results and the actual lead level in the paint (operating characteristic curves).

The three secondary study objectives were: (4) to understand XRF behavior in the field through the investigation of XRF measurements that were very different than their corresponding lab result; (5) to evaluate field quality assurance and control methods; and (6) to investigate the variability of lead levels in the paint within the study sampling locations.

FIELD TESTING

Three primary concerns of the field testing portion of the study were consistency, real world comparability, and quality control. Due to the differences among the three measurement methods: XRF, test kits, and laboratory analysis, field testing approaches necessarily varied somewhat. In order to ensure consistency, testing was standardized as much as possible. A template was designed for test locations throughout the study housing units, and the different measurement methods were systematically assigned to consistent test locations within the template. This approach ensured results could be compared across different test locations and measurement methods.

At each test location, chemical test kits were tested first. The individuals who did the field testing of the test kits were selected to represent typical homeowners who might purchase test kits for their personal use. That is, they did not have any specific scientific background nor prior training. To further replicate "real world" use, the test kits were rotated among the testers during the study. One of the test kits was an exception to this. It was a kit which is only used by state-certified inspectors. For that kit, a state-certified inspector was brought in and that particular kit was not included in the kit rotation. After each tester completed a test location, the used area of the template was covered to prevent subsequent testers from observing the results obtained by prior testers.

Once test kit testing was finished, paint samples were taken. Paint was removed from a specified location on the template and sent to a laboratory for spectroscopic analysis. A modified NIOSH method 7082 was followed with all appropriate quality control samples including laboratory and field duplicates.

XRF testing was the final step in the field portion of the study. It was conducted by trained and licensed XRF instrument operators employed by independent testing companies. XRF testing was carried out on the portions of the templates designated for this purpose. A number of quality control procedures were employed, including the use of National Institute of Standards and Technology (NIST) Standard Reference Material (SRM) paint films. The NIST SRM paint film is a thin layer of paint with a known level of lead enclosed between two layers of plastic. A portion of the template was scraped bare of paint, revealing the material underneath the paint, the substrate, which was either brick, concrete, drywall, metal, plaster or wood. The NIST SRM paint film was placed on the bare substrate and a reading was taken in order to determine if the substrate interfered with the XRF reading. In addition, blocks of known substrate materials, called control blocks, were utilized in the field. The NIST SRM paint film was placed on the appropriate block and XRF readings taken in order to determine if control block substrates could be surrogates for the substrates underlying the painted areas tested.

STUDY RESULTS:

Laboratory Analysis Results

There were two key results of the laboratory analyses. First, laboratory analysis results exhibited a wide range of lead levels with a distribution similar to that reported in the 1990 HUD National Survey of Lead-Based Paint in Housing. Second, lead levels appear to vary significantly across the same painted surface.

Two federal thresholds have been established to define lead-based paint on painted architectural components. If paint is found to contain lead equal to or greater than these thresholds, it is characterized as lead-based paint. The federal threshold in milligrams lead per unit area is 1.0 mg/cm^2. The federal threshold in percent lead by weight is 0.5%. Approximately 20% of the samples analyzed in this study were equal to or greater than the federal threshold of 1.0 mg/cm^2, while 29% were equal to or greater than the federal threshold of 0.5% lead. A rough numerical equivalence between results reported as mass of lead per unit area (mg/cm^2) and as percent lead by weight (%) was found in the study data. That is, 1.0 mg/cm^2 lead was found to be roughly equivalent to 1% lead by weight.

The variability of a set of test results is the extent to which the results in the set differ from one another. The standard deviation is a statistical measure of the extent that actual test results tending to spread about an average value. The typical relative standard deviation for laboratory analytical measurements in the study samples was 13%. Variability between field duplicate samples, taken nine inches apart at a subset of test locations, was much larger, between 30% - 60%, indicating significant variability in lead levels across the same painted surface. The statistical analysis of the data took variability in lead levels into account.

Chemical Test Kit Results

The primary result of the test kit evaluation is that they varied widely in their performance in classifying paint against either the 1.0 mg/cm^2 or 0.5% threshold. No single kit achieved a low rate of both false positive and false negative results and their performance varied across substrates.

A false negative result occurs when the kit fails to detect the presence of lead in paint equal to or greater than the federal threshold, but in fact, the paint is shown by laboratory analysis to contain lead equal to or greater than the threshold. Similarly, a false positive result occurs when the kit detects lead equal to or greater than the federal threshold, but laboratory analysis shows that the paint does not contain lead equal to or greater than the threshold.

No kit in the study achieved low rates of both false positive and false negative results. Two out of six kits were prone to false negative results. Negative test results obtained with these two kits do not necessarily indicate the absence of lead. The other four kits had a tendency to produce false positive results, even at levels of lead well below the federal thresholds.

Further, the performance of the test kits varied with different types of substrates. Most kits usually produced a positive result on at least one substrate, even for very low lead levels. This suggests positive interferences with the chemicals in the kits. On the other hand, some test kits demonstrated negative interferences on some substrates, as indicated by not always giving a positive result for high levels of lead.

XRF Results

The primary result of the XRF testing is that K-shell instruments were often effective in classifying paint samples against the federal threshold of 1.0 mg/cm^2, when using an inconclusive classification range, laboratory confirmation, and substrate correction, as needed. Generally, L-shell instruments had extremely high false negative rates, making them ineffective in classifying paint against the 1.0 mg/cm^2 threshold.

In this study, measurement bias, or bias, is the tendency of a set of test results to be either greater or less than the laboratory measurements of the lead content of the paint. If test results tending to be greater than the laboratory results, they are said to exhibit positive bias. If the test results tending to be less than the laboratory results, they exhibit negative bias. Results of tests using XRF instruments showed both positive and negative bias. Biases of the K-shell XRF instruments were strongly dependent on the underlying substrate. One K-shell instrument exhibited much less bias than the other XRF instruments. L-shell instruments generally had large negative biases at the 1.0 mg/cm^2 threshold that were usually independent of the substrate.

Substrate correction, using NIST SRM readings on either the scraped substrates or the control blocks, did not reduce bias for L-shell instruments. For K-shell instruments, results were mixed. Control block correction reduced bias for two instruments on some substrates. Correction using NIST SRM readings on the scraped substrate was effective for two instruments on most substrates, and for another instrument on some substrates.

The variability of the results from each XRF instrument was estimated by calculating a standard deviation. The results of most K-shell instruments exhibited high variability at the federal threshold of 1.0 mg/cm^2. The variability in the results from the L-shell instruments was significantly lower than that of K-shell instruments.

Despite their generally high variability and bias, K-shell instruments were often effective in classifying the paint samples in this study against the federal threshold of 1.0 mg/cm^2 when using an inconclusive classification range of 0.4 to 1.6 mg/cm^2 with mandatory laboratory confirmation. Without using an inconclusive range and laboratory confirmation, only two of the K-shell instruments had both false positive and false negative rates below 10%.

Generally, L-shell instruments had extremely high false negative rates. One L-shell instrument had moderate to high false negative rates, depending on the width of the inconclusive range, but still gave low readings on some samples with high levels of lead.

OVERALL RECOMMENDATIONS FOR TESTING

XRF Instrument Conclusions

The primary XRF conclusion is that testing by K-shell XRF instruments, <u>with</u> laboratory confirmation of inconclusive XRF results, and <u>with</u> substrate correction in cases where this is effective in reducing bias, is a viable way to test for lead-based paint. This approach can produce satisfactory results for classifying the paint on architectural components using the federal threshold of 1.0 mg/cm^2.

Further, the variability found in paint samples located approximately nine inches apart supports the conclusion that the most effective method of XRF testing of a single architectural component, such as a window sill, wall, or door, is to obtain readings at different points on the component, and compute their average. This would replace the current practice which is to average a number of XRF readings taken at a single point.

Chemical Test Kit Conclusions

The conclusion of this study is that test kits should not be used for lead paint testing. Test kits cannot determine the extent of lead-based paint in a home and the need for protecting the occupants, especially when repairs or renovations are carried out. Homeowners and renters cannot be confident that test kits will discriminate accurately between lead-based paint and non-lead based paint. They should not make decisions on repairs, renovations or abatements based on test kit results.

DATA DOCUMENTATION

This document provides documentation of the data files from the study and is intended to be used by researchers interested in conducting further analyses of the data.

1.0 INTRODUCTION

Three reports have been developed from the study outlined in the executive summary. This is the data documentation report. The summary report, entitled *A Field Test of Lead-Based Paint Testing Technologies: Summary Report* (EPA 747-R-95-002a), contains an overview of the results from the study. For readers that are interested in more technical detail on the study, there is a comprehensive technical report available: *A Field Test of Lead-Based Paint Testing Technologies: Technical Report* (EPA 747-R-95-002b). The summary report is available from the National Lead Information Center Clearinghouse (1-800-424-LEAD). The technical report is available from the National Technical Information Service (NTIS) by calling 703-487-4650, and requesting the report by its NTIS reference number, PB96-125026.

Data stored in eight analysis data sets, that were created from data collected in this study, are provided as well as descriptions of the eight data sets. These data are stored as ASCII files and were used for the statistical analysis of this study. In all cases, one or more spaces are used as delimiters in the data sets. The quality assurance procedures used on these data sets are provided in Chapter 7 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report* (EPA 747-R-95-002b). Sections 2 through 9 below provide detailed descriptions of the eight data sets including the standard record layouts of each and their corresponding data field definitions. The names and a brief description of each data set are given below.

Data Set	Brief Description of Stored Data
SAM_DEF	Sample definition and location information for data collected in Denver, Philadelphia and Louisville (discussed in section 2.0)
TEST_KIT	Chemical test kit measurement results for data collected in Denver, Philadelphia and Louisville (section 3.0)
XRF_NORM	XRF readings excluding control readings for data collected in Denver and Philadelphia (section 4.0)
PLT_NORM	XRF readings excluding control readings for data collected in Louisville (section 5.0)
XRF_CTRL	XRF control readings for data collected in Denver and Philadelphia (section 6.0)
PLT_CTRL	XRF control readings for data collected in Louisville (section 7.0)

Data Set	Brief Description of Stored Data
LAB_ICP	Laboratory ICP analysis results of paint-chip samples for data collected in Denver, Philadelphia and Louisville (section 8.0)
HUM_TEMP	Humidity and temperature data collected while in Denver and Philadelphia (section 9.0)

The data stored in these data sets matches that reported on the original hand-written field data sheets with the exception of those data listed in section 10 of this report, which were changed due to comparisons with electronically stored data. Several of the XRF instruments that were used in this study stored XRF data electronically. The electronically stored data are not listed in this report but were used for comparisons to the original hand-written field data sheets. Data that were changed due to errors identified from comparing electronically stored data to the original hand-written data sheets are documented in section 10.

Section 11 describes records earmarked for removal from the primary analysis data sets. A flag variable appears in the TEST_KIT, XRF_NORM, XRF_CTRL, and LAB_ICP data sets which identifies records for removal from the primary study analysis data sets. This flag would be set if, for example, an XRF measurement was interrupted due to a power failure and the measurement was taken again once power was restored. The first measurement would be flagged for removal while the second measurement would be used for analyses. A complete list of the records flagged for removal is provided in section 11. A description of why each record was so designated is also provided.

Section 12 provides corrections to errata identified in the report *A Field Test of Lead-Based Paint Testing Technologies: Technical Report*.

1.1 Identification Numbers

Seven of the eight data sets listed above use a similar system for identifying where measurements were taken. The HUM_TEMP data set is the exception. The SAM_DEF, TEST_KIT, XRF_NORM, PLT_NORM, and LAB_ICP data sets use the identification number that was assigned to each sample location in Denver, Philadelphia, and Louisville. These identification numbers have common ranges so that the identification number may be used to identify the city or dwelling from which the data were taken and to map between data sets. Similarly, the control data sets (XRF_CTRL and PLT_CTRL) have identification numbers that identifies the city or dwelling from which the data were taken. Identification numbers in the control data sets are different from those in the other data sets because XRF control readings were taken at standardized central locations on control blocks and not on the study sample locations. For a detailed discussion about XRF testing procedures see section 3.5 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report*.

Data from Denver have identification numbers ranging from 80001 to 80999. Data from Philadelphia have identification numbers ranging from 81000 to 81999. The identification numbers for data from Louisville range from 905501 to 905625. Table 1 shows the identification number ranges for each dwelling (see section 2.2) in each of the three cities in the study.

Table 1. Lower and Upper Bounds of Identification Number Ranges for Sample and Control Locations Categorized by City and Dwelling.

CITY	**DWELLING**	**SAMPLE LOCATION RANGE BOUNDS**		**CONTROL LOCATION RANGE BOUNDS**	
		Lower	**Upper**	**Lower**	**Upper**
Denver	1	80001	80075	80080	80099
	2	80101	80175	80180	80194
	3	80205	80279	80280	80297
	4	80305	80379	80380	80397
	5	80405	80479	80480	80496
	6	80505	80579	80580	80594
	7	80605	80679	80680	80693
	8	80705	80779	80780	80795
	9	80805	80879	80880	80896
	10	80905	80979	80980	80994
Philadelphia	1	81205	81259	81260	81277
	2	81305	81359	81360	81377
	3	81405	81459	81460	81481
	4	81505	81559	81560	81577
	5	81605	81659	81660	81680
	6	81705	81759	81760	81777
	7	81805	81859	81860	81877
	8	81905	81959	81960	81976
Louisville	1	905501	905552	905553	905558
	2	905560	905619	905620	905625

1.2 Technologies

Three technologies were in the study: chemical test kits, portable X-ray fluorescence (XRF) instruments, and laboratory analysis of paint samples. Chemical test kits detect the presence of lead in paint by a chemical reaction that occurs when chemicals in the kit are exposed to lead. This reaction causes a color change to occur if lead is present in the paint. The test kits in the study represented the range of kits available at the time the study was conducted. Test kits from five different manufacturers were examined in this study: three rhodizonate based kits, two sodium sulfide based kits, and one proprietary kit. Both of the most common types of chemical test kits, rhodizonate based kits and sodium sulfide based kits, were used in the pilot study. The rhodizonate kits included were LeadCheck (also called LeadCheck II) and the sanding and coring versions of Lead Alert; the sodium sulfide kits were Lead Detective and the Massachusetts state-approved kit. The pilot study also included the Lead Zone kit, which utilizes proprietary chemistry. It was expected that the results of the pilot study would be similar for kits based on similar chemistry, that is, rhodizonate or sodium sulfide, so that fewer kits would need to be included in the full study. However, the test results were not similar for kits utilizing similar chemistry, so the same six kits were included in the full study.

Portable XRF instruments direct high energy X-rays and gamma rays into paint. These high-energy rays strike lead atoms, causing electrons to be ejected from their electron orbits, or shells. In a process called fluorescence, other electrons refill the voids left by the ejected electrons, producing X-rays. These X-rays have specific frequencies based on differences in energy between the electron shells which contained the emitted electrons and the electron shells which received the electrons. The amount of X-ray energy emitted at several specific frequencies, in this case called K-shell or L-shell X-ray energy, is measured by detectors on XRF instruments and used to calculate the amount of lead in paint.

XRF instruments are classified by the type of X-ray energy that they detect, K-shell X-rays, L-shell X-rays, or both. K-shell X-rays are more highly penetrating than L-shell X-rays since L-shell X-rays have lower energy. For this reason, K-shell X-rays are more useful for detecting lead in deeper layers of paint. Two of the XRF instruments in this study detected K-shell X-rays, two XRF instruments detected L-shell X-rays, and two instruments detected both K-shell and L-shell X-rays.

Efforts were made to include a representative example of every XRF instrument available at the time of the study. Six types of XRF instruments were in the study. The

MAP-3, the Microlead I, and the XK-3 were included because they were the most commonly used instruments for LBP testing when the study began. The X-MET 880 was included because it performed successfully in the pilot study. After completion of the pilot study, all other known manufacturers of XRF instruments or working prototypes were invited to participate in a day of ruggedness testing to determine whether the instruments were portable and could function reliably throughout a full day of field testing. As a result, two additional instruments, the Lead Analyzer and a prototype of the XL, were included in the full study. Since the conclusion of the field portion of the study, new XRF instruments and modified versions of some tested instruments have become commercially available.

The third type of technology in the study was laboratory analysis which was used to verify results obtained by the two field technologies: chemical test kits and XRF instruments. For this study, the laboratory instrument used was an atomic emission spectrophotometer. The laboratory procedure involved dissolving paint samples in acid, then filtering and diluting them. A portion of the dissolved sample was placed in the spectrophotometer and heated to extremely high temperatures by a device inside the spectrophotometer called a high temperature atomizer. At very high temperatures, most of the sample is broken down into individual atoms. Individual atoms absorb and re-emit energy produced by the atomizer. Atoms of different chemical elements re-emit energy at different energy levels. A detector in the spectrophotometer sorts and measures the energy re-emitted by the atoms of different chemical elements. In this way, the amount of energy re-emitted by lead atoms is measured and then used to calculate the amount of lead in the sample. The particular type of spectrophotometer used in this study was an inductively coupled plasma atomic emission spectrophotometer (ICP). The analytical laboratory results were continually evaluated by using reference materials to assure the accuracy of the laboratory analysis of field samples.

Chemical test kit results were reported as either negative or positive indicating the absence of lead or presence of lead, respectively. XRF instruments and laboratory analysis results were reported as quantitative measures of lead. XRF instruments report their results as mass of lead per unit area (mg/cm^2). Laboratory analysis results were reported both as mass of lead per unit area (mg/cm^2) and percent lead by weight (%).

2.0 SAM_DEF: SAMPLE DEFINITION DATA SET

There are fourteen (14) data fields per record in the sample definition (SAM_DEF) data set containing data describing sample locations in Denver, Philadelphia, and Louisville. In general, this data set contains data that characterizes the sample location such as the component, substrate, and the color of the paint. Descriptions and names of the data fields along with their widths, columns, and variable types are given in section 2.1. Section 2.2 provides data definitions for each data field identified in section 2.1.

2.1 SAM_DEF: Standard Record Layout

Description	Name	Width	Columns	Type
Identification number	IDNO	6	3 - 8	Integer
Address code	ADDRESS	2	10 - 11	Integer
Dwelling code	DWELLING	2	13 - 14	Integer
Location code	LOCATE	2	16 - 17	Integer
Wall	WALL	1	19	Alpha
Component code	COMP	2	21 - 22	Integer
Substrate type code	SUB	1	24	Alpha
Sample type	TYPE	1	26	Integer
Side-by-side code	SBS	1	28	Integer
Component color code	COLOR	2	30 - 31	Integer
Texture code	TEXTURE	1	33	Integer
Height code	UP_DOWN	2	35 - 36	Integer
Five foot line code	FIVE_FT	1	38	Alpha
Comment	COMMENT	50	40 - 89	Alpha

2.2 SAM_DEF: Data Definitions

IDNO: Identification number assigned to each sample location (see section 1.1).

ADDRESS: The codes 1 through 14 were used to indicate address where the sample site was located. In Denver, where ten single-family houses were tested, the codes 1 through 10 were used to designate the ten addresses. In Philadelphia, where the eight units tested were in two buildings, the codes 11 and 12 were used to designate the two addresses. Similarly, in Louisville, where the four units tested were in two buildings, the codes 13 and 14 were used to

2.2 SAM_DEF: Data Definitions (cont.)

designate the two addresses. For a discussion about site selection see section 3.1.1 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report*.

DWELLING: Ten dwelling codes were used to indicate the actual unit within an address where the sample site was located. The dwelling codes 1 through 10 were used in Denver; one for each single-family house. These dwelling codes are the same as the address codes since, in Denver, all testing was done in single-family housing. In Philadelphia, the dwelling codes 1 through 8 were used. The first four (1 through 4) were in address 11 and the latter four (5 through 8) were in address 12. In Louisville, two living quarters were treated as one dwelling. Thus, dwelling code 1 was in address 13 and dwelling code 2 was in address 14.

LOCATE: Twenty-seven (27) location codes were used to identify the room in which each sample was located and are given below. To identify multiple bedrooms within a dwelling, each bedroom was assigned either a #1, #2, or #3. In Denver and Louisville the bedrooms were given the number indicated on the floor plans provided by the appropriate public housing authority. In Philadelphia two bedroom units, the front bedroom was assigned #1 and the back bedroom was assigned #2. For Philadelphia three bedroom units the front bedroom was assigned #1, the inside wall back bedroom was assigned #2, and the outside wall back bedroom was assigned #3.

2.2 SAM_DEF: Data Definitions (cont.)

Code	Location Description	Code	Location Description
1	Kitchen	15	Exterior (general)
2	Living room/front room	16	Utility room
3	Bathroom	17	Kitchen/hall
4	Bedroom #1	18	Dining room
5	Bedroom #2	19	Garage
6	Bedroom #3	20	Closet: front room
7	Hall	21	Basement
8	Stairway	22	Closet: bedroom #1
9	Front porch	23	Closet: bedroom #2
10	Back porch	24	Closet: bedroom #3
11	Upstairs porch	25	Closet: hall
12	Kitchen/living room	26	Shed
13	Living room/stairway	99	Unknown
14	Bathroom/hall		

WALL: Four wall codes were used. Wall A was assigned to the wall that was oriented to the front of the house or unit and parallel to the front wall. Walls B through D were assigned to each wall in a clockwise manner from wall A. The following codes were assigned to the walls.

Code	Relative Wall Location
A	Parallel to the front side of house or unit
B	Assigned 1st in a clockwise manner from A
C	Assigned 2nd in a clockwise manner from B
D	Assigned 3rd in a clockwise manner from C

COMP: Fifty-one component codes were used. For a discussion about component selection see section 3.1.2 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report*.

2.2 SAM_DEF: Data Definitions (cont.)

Code	Component Description	Code	Component Description
1	Door frame: exterior	27	Gutter
2	Door frame	28	Downspout
3	Door: exterior	29	Door jamb
4	Door: interior	30	Door casing
5	Window sill: exterior	31	Door
6	Window sill: interior	32	Window sill
7	Window casing	33	Window sash
8	Bar top	34	Facia
9	Threshold	35	Shutter
10	Shelf	36	Header
11	Closet wall	37	Drawer
12	Shelf support	38	Cabinet
13	Wall trim	39	Closet door
14	Wall	40	Closet shelf
15	Support column	41	Foundation
16	Ceiling beam	42	Mail box or slot
17	Ceiling hatch door	43	Heating register
18	Floor baseboard	44	Pipe
19	Electrical box cover	45	Plumbing access
20	Duct	46	Rafter support
21	Stair riser	47	Rafter
22	Stair stringer	48	Floor
23	Coat rack support	49	Roof flashing
24	Medicine cabinet interior	50	Closet baseboard
25	Side of bar	51	Awning
26	Railing cap		

SUB: Data was collected from six substrates. For a discussion about substrate selection see section 3.1.3 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report*. The following codes were assigned to each substrate.

2.2 SAM_DEF: Data Definitions (cont.)

Code	Substrate	Code	Substrate
B	Brick	M	Metal
C	Concrete	P	Plaster
D	Drywall	W	Wood

TYPE: Type codes were used to identify different categories of XRF readings. Codes 1 through 3 are assigned to the standard, special, and "special-special" XRF reading categories, respectively. Standard readings are described in section 3.5.2.6 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report*. Special and special-special readings are described in section 3.5.2.7 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report*.

SBS: A code of 0 indicates the sample is not a field duplicate paint-chip sample (side-by-side), while a code of 1 indicates that it is. For a discussion about field duplicates see section 3.2.2.3 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report*.

2.2 SAM_DEF: Data Definitions (cont.)

COLOR: The following codes list the observed colors on the painted surfaces.

Code	Color	Code	Color
1	Brown	8	Silver
2	White	9	Green
3	Beige	10	Grey
4	Blue	11	Black
5	Yellow	12	Tan
6	Pink	13	Orange
7	Red		

TEXTURE: Surface texture data were collected at the Denver and Philadelphia sample locations. Texture data were not collected in Louisville. The texture data collected in Denver were deemed unreliable and removed from this data set. The Philadelphia sample location's texture was rated on a scale from 1 to 3, with 1 being smooth and 3 being rough.

UP_DOWN: The UP_DOWN variable pertains to doors and door frames in Philadelphia only. This is because Philadelphia was the only site with indications of lead abatement on doors and door frames below 5 feet. A sample location received the code 1 if it was above five feet, the code -1 if it was below five feet, and the code 0 if it straddled the five foot line.

FIVE_FT: The FIVE_FT variable also only pertains to doors and door frames in Philadelphia for the reason stated above. A sample received the code Y if there were indications of lead abatement below five feet, and N, otherwise.

COMMENT: Miscellaneous comments about the sample or location.

3.0 TEST_KIT: CHEMICAL TEST KIT MEASUREMENT DATA SET

There are nine (9) data fields per record in the test kit results (TEST_KIT) data set containing data from Denver, Philadelphia, and Louisville. Descriptions and names of the data fields along with their widths, columns, and variable types are given in section 3.1. Section 3.2 provides data definitions for each data field identified in section 3.1.

3.1 TEST_KIT: Standard Record Layout

Description	Name	Width	Columns	Type
Omission flag	OMIT	1	1	Alpha
Identification number	IDNO	6	3 - 8	Integer
Date	DATE	8	10 - 17	Date
Name of test kit	KIT	1	19	Integer
Field sampler code	PERSON	2	21 - 22	Integer
Start time	S_TIME	5	24 - 28	Time
Time of observation	E_TIME	5	30 - 34	Time
LBP determination code	RESULT	1	36	Integer
Shade of result	SHADE	1	38	Integer

3.2 TEST_KIT: Data Definitions

OMIT: Flags records to be omitted from the primary study analyses. See section 10.0 for a discussion about the omission flag.

IDNO: Identification number assigned to the sample location (see section 1.1).

DATE: The date of data collection is stored using the following format: MM/DD/YY. For example, July 31, 1993 is stored as 07/31/93.

KIT: Six test kits were used. For a discussion about test kit selection see section 3.4.1 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report*. The following codes were assigned to the test kits.

3.2 TEST_KIT: Data Definitions (cont.)

Code	Test Kit Name	Code	Test Kit Name
1	LeadCheck	4	Lead Alert: Coring
2	Lead Alert: Sanding	5	Lead Detective
3	Lead Zone	6	State Sodium Sulfide

PERSON: Codes 1 through 19 were assigned to the individuals collecting test kit data. For a discussion about test kit testing personnel see section 3.4.2.3 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report*.

S_TIME: The four digit 24 hour clock military time (including the colon) is the start time of data collection. For example, 3:24 PM would be stored as 15:24.

E_TIME: The time of observation; stored in military time format (including the colon).

RESULT: The observed test kit result recorded as the values 0 and 1 for negative and positive, respectively.

SHADE: The degree or intensity of positive results reported on a scale of 1 to 5 for the Lead Detective and State Sodium Sulfide test kits only.

4.0 XRF_NORM: XRF MEASUREMENT DATA SET

There are twenty-three (23) data fields per record in the XRF reading (XRF_NORM) data set containing data collected in Denver and Philadelphia. Descriptions and names of the data fields in the full study data set along with their widths, columns, and variable types are given in section 4.1. Section 4.2 provides data definitions for each data field identified in section 4.1.

4.1 XRF_NORM: Standard Record Layout

Description	Name	Width	Columns	Type
Omission flag	OMIT	1	1	Alpha
Identification number	IDNO	6	3 - 8	Integer
Date	DATE	8	10 - 17	Date
XRF instrument	INSTR	1	19	Integer
Operator	OPERATOR	2	21 - 22	Integer
XRF machine identifier	XRF_ID	1	24 - 25	Integer
Monitor	MONITOR	2	27 - 28	Integer
Reading shell	SHELL	1	30	Alpha
Length of reading	LENGTH	1	32	Integer
Time of observation	TIME	5	34 - 38	Time
1st paint reading	PNT_1	7	40 - 46	Real
2nd paint reading	PNT_2	7	48 - 54	Real
3rd paint reading	PNT_3	7	55 - 62	Real
1st red (1.02) film	RED_1	7	64 - 70	Real
2nd red (1.02) film	RED_2	7	72 - 78	Real
3rd red (1.02) film	RED_3	7	80 - 86	Real
1st bare reading	BARE_1	7	88 - 94	Real
2nd bare reading	BARE_2	7	96 -102	Real
3rd bare reading	BARE_3	7	104-110	Real
Additional information	ADD_INFO	4	112-114	Real
Serial number code	SER_ID	2	117-118	Integer

4.2 XRF_NORM: Data Definitions

OMIT: Flags records to be omitted from the primary study analyses. See section 10.0 for a discussion about the omission flag.

IDNO: Identification number assigned to the sample location (see section 1.1).

4.2 XRF_NORM: Data Definitions (cont.)

DATE: Date of data collection using the following format: MM/DD/YY.

INSTR: Six XRF instruments were used. For a discussion about XRF instrument selection see section 3.5.1 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report*. The following codes were assigned to each XRF instrument.

Code	Instrument	Code	Instrument
1	XL prototype	4	MAP-3
2	X-MET 880	5	Pb Analyzer
3	XK-3	6	Microlead I

OPERATOR: Eleven codes, A through N, were assigned to each of the XRF operators. For a discussion about the XRF operator selection see section 3.5.2.1 and Table 6-10 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report*.

XRF_ID: Multiple instruments from the same manufacturer were present in the field. Field classifications were developed using the Roman numerals I and II to differentiate between these multiple instruments. Also, for data collection and analysis purposes, XRF instruments that provided both K-shell and L-shell readings were classified as two distinct instruments. For a discussion about XRF instrument selection see section 3.5.1 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report*. The following codes were assigned to each of the field classifications.

Code	Device	Code	Device
1	XL prototype	7	MAP-3 K-shell (II)
2	X-MET 880	8	MAP-3 L-shell (II)
3	XK-3 (I)	9	Pb Analyzer K-shell
4	XK-3 (II)	10	Pb Analyzer L-shell
5	MAP-3 K-shell (I)	11	Microlead I (I)
6	MAP-3 L-shell (I)	12	Microlead I (II)

MONITOR: The codes 1 through 21 were assigned to the twenty-one monitors selected to record XRF readings and to observe the XRF operator. For a discussion about the XRF monitor selection see section 3.5.2.1 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report*.

4.2 XRF_NORM: Data Definitions (cont.)

SHELL: A letter, either K or L that indicates which shell the detected energy originated from.

LENGTH: Three different XRF reading times were used during XRF testing. Only the MAP-3 instruments were assigned codes 2 and 3 (which are the test and confirm modes, respectively, for that instrument). For a discussion about alternative XRF reading times see section 3.5.2.7 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report*. The following codes were assigned to each of the reading times.

Code	Length
1	Nominal 15-second
2	Nominal 60-second
3	Nominal 240-second

TIME: The four digit 24 hour clock military time (including the colon) is the start time of the series of XRF readings for the sample location.

PNT_*i*: XRF readings taken on the painted surface where *I* is 1, 2, or 3. Up to three XRF readings were taken on the painted surface of the sampling location and were recorded in the order taken. For a discussion about XRF measurement design see section 3.5.2 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report*.

RED_*i*: XRF readings using the red NIST SRM film where *I* is 1, 2, or 3. Up to three XRF readings were taken on the bare substrate area of the sampling location covered with the NIST SRM red (1.02 mg/cm^2) film (recorded in the order taken).

BARE_*i*: XRF readings on the bare substrate where *I* is 1, 2, or 3. Up to three XRF readings were taken on the bare substrate area of the sampling location (recorded in the order taken). These XRF readings were only taken on samples designated "special" or "special-special".

ADD_INFO: Specific additional information that was collected from the Microlead I and XL instruments. Density measurements of the substrate were collected from the Microlead I instruments at approximately 13% of the Denver sample locations and approximately 95% of the Philadelphia sample locations. The absorption rate was collected with the XL prototype from approximately 15% of the Denver sample locations and approximately 95% of the Philadelphia sample locations.

4.2 XRF_NORM: Data Definitions (cont.)

SER_ID: The serial number of each XRF instrument was coded using two digits. Table 6-1 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report* provides the XRF instrument serial number codes.

5.0 PLT_NORM: PILOT XRF MEASUREMENT DATA SET

There are twenty-one (21) data fields per record in the pilot XRF reading (PLT_NORM) data set containing data collected in Louisville only. The XRF data collected in Louisville differed enough from the XRF data collected in Denver and Philadelphia (stored in the XRF_NORM data set) to warrant a separate data set. Descriptions and names of the data fields in the PLT_NORM data set along with their widths, columns, and variable types are given in section 5.1. Section 5.2 provides data definitions for each data field identified in section 5.1.

5.1 PLT_NORM: Standard Record Layout

Description	Name	Width	Columns	Type
Identification number	IDNO	6	1 - 6	Integer
Date	DATE	6	8 - 13	Date
XRF machine identifier	XRF_ID	1	15	Integer
Length	LENGTH	1	17	Integer
Time of observation	TIME	5	19- 23	Time
Substrate type code	SUB	1	25	Alpha
Type of reading	TYPE	2	27- 28	Integer
1st paint reading	PNT_1	6	30- 35	Real
2nd paint reading	PNT_2	6	37- 42	Real
3rd paint reading	PNT_3	6	44- 49	Real
4th paint reading	PNT_4	6	51- 56	Real
1st red (1.02) film	RED_1	6	58- 63	Real
2nd red (1.02) film	RED_2	6	65- 70	Real
3rd red (1.02) film	RED_3	6	72- 77	Real
4th red (1.02) film	RED_4	6	79- 84	Real
1st yellow (3.53) film	YEL_1	6	86- 91	Real
2nd yellow (3.53) film	YEL_2	6	93- 98	Real
3rd yellow (3.53) film	YEL_3	6	99-105	Real
4th yellow (3.53) film	YEL_4	6	107-112	Real
Normal density	DEN_1	3	114-117	Real
Red film density	DEN_2	3	119-122	Real
Yellow film density	DEN_3	3	124-127	Real

5.2 PLT_NORM: Data Definitions

IDNO: Identification number assigned to each sample location (see section 1.1).

DATE: The date of data collection is recorded using the following format: MMDDYY. Note that this date format is different from previous data sets.

XRF_ID: Four XRF instruments were used. However, one of these instruments provided both K-shell and L-shell readings. For data collection and analysis purposes, results from this instrument were classified as coming from two distinct instruments. Thus, five codes were used. For a discussion about XRF instrument selection see section 3.5.1 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report*. The following codes were assigned to each XRF instrument.

Code	Instrument
1	X-MET 880
2	XK-3
3	MAP-3 K-shell
4	MAP-3 L-shell
5	Microlead I

LENGTH: Two different XRF reading times were used during XRF testing for the pilot study. For a discussion about alternative XRF reading times see section 3.5.2.7 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report*. The following codes were assigned to each of the reading times.

Code	Length
1	Nominal 15-second
2	Nominal 60-second

TIME: The four digit 24 hour clock military time (including the colon) is the start time of the series of readings at a sample location.

5.2 PLT_NORM: Data Definitions (cont.)

SUB: Data was collected from six substrates. For a discussion about substrate selection see section 3.1.3 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report*. Note that the drywall substrate code is different from the code given drywall in the data sets described above. The following codes were assigned to each substrate.

Code	Substrate	Code	Substrate
B	Brick	M	Metal
C	Concrete	P	Plaster
D	Drywall	W	Wood

TYPE: Type codes were assigned to identify different categories of XRF readings. Standard readings are described in section 3.5.2.6 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report*. Special readings are described in section 3.5.2.7 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report*. Variability check readings are described in section 3.5.2.4 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report*. A reshoot reading is a sample measurement which was re-taken as a result of either a request from the operator or, in the case of the Microlead I, a premature release of the XRF instrument's trigger. The following codes were assigned to the type XRF reading.

Code	Type of Reading
1	Standard
2	Special
3	Variability check
4	Reshoot

PNT_*i*: XRF readings taken on the painted surface where *I* is 1, 2, 3 or 4. Up to four XRF readings were taken on the painted surface of the sampling location (recorded in the order taken). For a discussion about XRF measurement design see section 3.5.2 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report*.

RED_*i*: XRF readings taken using the red NIST SRM film where *I* is 1, 2, 3 or 4. Up to four XRF readings were taken on the bare substrate area of the sampling location that were covered with the NIST SRM red (1.02 mg/cm^2) film (recorded in the order taken).

5.2 PLT_NORM: Data Definitions (cont.)

YEL_*i*: XRF readings taken using the yellow NIST SRM film where ***I*** is 1, 2, 3, or 4. Up to four XRF readings were taken on the bare substrate of concrete sampling locations that were covered with the yellow NIST SRM (3.53 mg/cm^2) film (recorded in the order taken).

DEN_*i*: Density measurements where ***I*** is 1, 2, or 3. These measurements were from the Microlead I for readings taken on 1) paint samples, 2) bare substrate covered with the NIST SRM red (1.02 mg/cm^2) film, and 3) bare substrate covered with the NIST SRM yellow (3.53 mg/cm^2) film, respectively. Density was collected at approximately 20% of the sample locations in Louisville.

6.0 XRF_CTRL: XRF CONTROL MEASUREMENT DATA SET

There are twenty-two (22) data fields per record in the full study XRF_CTRL data set that contain continuing, initial, and ending control readings from Denver and Philadelphia. Descriptions and names of the data fields in the (full study) XRF_CTRL data set along with their widths, columns, and variable types are given in section 6.1. Section 6.2 provides data definitions for each data field identified in section 6.1.

6.1 XRF_CTRL: Standard Record Layout

Description	Name	Width	Columns	Type
Omission flag	OMIT	1	1	Alpha
Identification no.	IDNO	6	3 - 8	Integer
Date	DATE	8	10 - 17	Date
XRF instrument	INSTR	1	19	Integer
Operator	OPERATOR	1	21 - 22	Integer
XRF machine id.	XRF_ID	2	24 - 25	Integer
Monitor	MONITOR	2	27 - 28	Integer
Substrate	SUB	1	30	Alpha
Type	TYPE	1	32	Integer
Time of observation	TIME	5	34 - 38	Time
Reading shell	SHELL	1	40	Alpha
1st yellow film	YEL_1	7	42 - 48	Real
2nd yellow film	YEL_2	7	50 - 56	Real
3rd yellow film	YEL_3	7	58 - 64	Real
1st red film	RED_1	7	66 - 72	Real
2nd red film	RED_2	7	74 - 80	Real
3rd red film	RED_3	7	82 - 88	Real
1st bare substrate	BARE_1	7	90 - 96	Real
2nd bare substrate	BARE_2	7	98 -104	Real
3rd bare substrate	BARE_3	7	106-112	Real
Serial number code	SER_ID	2	114-115	Integer

6.2 XRF_CTRL: Data Definitions

OMIT: Flags records to be omitted from the main study analyses. See section 10.0 for a discussion about the omission flag.

6.2 XRF_CTRL: Data Definitions (cont.)

IDNO: Identification number assigned to each sample location (See section 1.1).

DATE: Date of data collection using the following format: MM/DD/YY.

INSTR: Six XRF instruments were used. For a discussion about XRF instrument selection see section 3.5.1 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report*. The following codes were assigned to each XRF instrument.

Code	Instrument	Code	Instrument
1	XL prototype	4	MAP-3
2	X-MET 880	5	Pb Analyzer
3	XK-3	6	Microlead I

OPERATOR: Nine codes, A through N were assigned to each of the XRF operators. For a discussion about the XRF operator selection see section 3.5.2.1 and Table 6-10 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report*.

XRF_ID: Multiple instruments from the same manufacturer were present in the field. Field classifications were developed using the roman numerals I and II to differentiate between these multiple instruments. Also, for data collection and analysis purposes, XRF instruments that provided both K-shell and L-shell readings were classified as two distinct instruments. For a discussion about XRF instrument selection see section 3.5.1 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report*. The following codes were assigned to each of the field classifications.

Code	Device	Code	Device
1	XL prototype	7	MAP-3 K-shell (II)
2	X-MET 880	8	MAP-3 L-shell (II)
3	XK-3 (I)	9	Pb Analyzer K-shell
4	XK-3 (II)	10	Pb Analyzer L-shell
5	MAP-3 K-shell (I)	11	Microlead I (I)
6	MAP-3 L-shell (I)	12	Microlead I (II)

MONITOR: The codes 1 through 21 were assigned to the twenty-one monitors selected for XRF testing. For a discussion about the XRF monitor selection see section 3.5.2.1 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report*.

6.2 XRF_CTRL: Data Definitions (cont.)

SUB: Data was collected from six substrates. For a discussion about substrate selection see section 3.1.3 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report*. The following codes were assigned to each substrate.

Code	Substrate	Code	Substrate
B	Brick	M	Metal
C	Concrete	P	Plaster
D	Drywall	W	Wood

TYPE: Type codes were assigned to identify different categories of XRF control readings. Control readings are described in section 3.5.2.9 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report*. The following codes were assigned to the type of XRF control reading.

Code	Type
1	Continuing control
2	Initial control
3	Ending control

TIME: The four digit 24 hour clock military time (including the colon) is the start time of the series of readings at a sample location.

SHELL: A letter, either K or L, that indicates which shell the detected energy originated from.

YEL_*i*: XRF readings taken using the yellow NIST SRM film where *I* is 1 through 3, inclusive. Up to three 15-second nominal XRF readings were taken on control blocks covered with the NIST SRM yellow (3.53 mg/cm^2) film (recorded in the order taken). For a discussion about XRF measurement design see section 3.5.2 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report*.

RED_*i*: XRF readings taken using the red NIST SRM film where *I* is 1 through 3, inclusive. Up to three 15-second nominal XRF readings were taken on control blocks covered with the NIST SRM red (1.02 mg/cm^2) film (recorded in the order taken).

6.2 XRF_CTRL: Data Definitions (cont.)

BARE_*i*: XRF readings taken on the bare substrate where *I* is 1 through 3, inclusive. Up to three 15-second nominal XRF readings were taken on bare control blocks (recorded in the order taken).

SER_ID: The serial number of each XRF instrument was coded using two digits. Table 6-1 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report* provides the XRF instrument serial number codes.

7.0 PLT_CTRL: PILOT XRF CONTROL MEASUREMENT DATA SET

There are twenty-four (24) variables per record in the pilot study PLT_CTRL data set that contain initial, continuing, and ending control readings from Louisville only. The XRF control data collected in Louisville differed enough from the XRF control data collected in Denver and Philadelphia (stored in the XRF_CTRL data set) to warrant a separate data set. Descriptions and names of the data fields in the (pilot study) PLT_CTRL data set along with their widths, columns, and variable types are given in section 7.1. Section 7.2 provides data definitions for each data field identified in section 7.1.

7.1 PLT_CTRL: Standard Record Layout

Description	Name	Width	Columns	Type
Identification no.	IDNO	6	1 - 6	Integer
Date	DATE	6	8 - 13	Integer
XRF Instrument code	XRF_ID	1	15	Integer
Type of reading	TYPE	1	17	Integer
Length of reading	LENGTH	1	19	Integer
Time of observation	TIME	5	21- 25	Alpha
Substrate type code	SUB	1	27	Alpha
NIST SRM film level	LEVEL	1	29	Integer
1st control reading	CTRL_1	6	31- 36	Real
2nd control reading	CTRL_2	6	38- 43	Real
3rd control reading	CTRL_3	6	45- 50	Real
4th control reading	CTRL_4	6	52- 57	Real
5th control reading	CTRL_5	6	59- 64	Real
6th control reading	CTRL_6	6	66- 71	Real
7th control reading	CTRL_7	6	73- 78	Real
8th control reading	CTRL_8	6	80- 85	Real
9th control reading	CTRL_9	6	87- 92	Real
Density reading	DENSITY	4	94- 97	Real
Humidity	HUMID	4	99-102	Real
Temperature	TEMP	4	104-107	Real

7.2 PLT_CTRL: Data Definitions

IDNO: Identification number assigned to each sample location (see section 1.1).

DATE: The date of data collection is recorded using the following format: MMDDYY.

XRF_ID: Four XRF instruments were used. However, one of these instruments provided both K-shell and L-shell readings. For data collection and analysis purposes, results from this instrument were classified as coming from two distinct instruments. Thus, five codes were used. For a discussion about XRF instrument selection see section 3.5.1 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report*. The following codes were assigned to each XRF instrument.

Code	Instrument
1	X-MET 880
2	XK-3
3	MAP-3 K-shell
4	MAP-3 L-shell
5	Microlead I

TYPE: Type codes were assigned to identify the beginning, continuing, and ending control readings and the reshoot readings. Beginning, continuing, and ending control readings are described in section 3.5.2.9 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report*. A reshoot reading is a sample measurement which was re-taken as a result of either a request from the operator or, in the case of the Microlead I, a premature release of the XRF instrument's trigger. The following codes were assigned to the type of XRF reading.

Code	Type of Reading
1	Beginning control
2	Ending control
3	Continuing control
4	Reshoot

7.2 PLT_CTRL: Data Definitions (cont.)

LENGTH: Two different XRF reading times were used during pilot XRF testing. For a discussion about alternative XRF reading times see section 3.5.2.7 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report*. The following codes were assigned to each of the XRF reading times.

Code	Length
1	Nominal 15-second
2	Nominal 60-second

TIME: The four digit 24 hour clock military time (including the colon) is the start time of the series of readings.

SUB: Data was collected from six substrates. For a discussion about substrate selection see section 3.1.3 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report*. Note that the drywall substrate code is different from the code assigned to drywall in the XRF_NORM and XRF_CTRL data sets described above. The following codes were assigned to each substrate.

Code	Substrate	Code	Substrate
B	Brick	M	Metal
C	Concrete	P	Plaster
D	Drywall	W	Wood

LEVEL: The following codes were assigned to classify NIST SRM paint films.

Code	NIST SRM Film
1	Yellow (3.53 mg lead/cm^2)
2	Red (1.02 mg lead/cm^2)

CTRL_*i*: XRF control reading code where *I* is 1 through 9, inclusive. These are the XRF control readings which were taken on control blocks covered with a specific level of NIST SRM film. Depending on the instrument, there were from one to nine readings taken (recorded in the order taken). For a discussion about XRF measurement design see section 3.5.2 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report*.

7.2 PLT_CTRL: Data Definitions (cont.)

DENSITY: Density measurements recorded from the Microlead I XRF instrument. Density measurements were collected at approximately 50% of Louisville sample locations.

HUMID: Humidity measurements were taken whenever control readings were taken.

TEMP: Temperature measurement were taken whenever control readings were taken.

8.0 LAB_ICP: LABORATORY ANALYSIS DATA SET

There are nineteen (19) data fields per record in the laboratory analysis (LAB_ICP) data set containing data collected in Denver, Philadelphia, and Louisville. Descriptions and names of the data fields along with their widths, columns, and variable types are given in section 8.1. Section 8.2 provides data definitions for each data field identified in section 8.1.

8.1 LAB_ICP: Standard Record Layout

Description	Name	Width	Columns	Type
Omission flag	OMIT	1	1	Integer
Identification number	IDNO	6	3 - 8	Integer
Duplicate sample flag	DUPE	1	10	Integer
Run number	RUN_NO	3	12 - 14	Integer
Sample description	SAMPLE	11	16 - 26	Alpha
Name	NAME	1	28	Integer
Collection date	DATE_C	6	30 - 35	Date
Analysis date	DATE_A	6	37 - 42	Date
Batch code	BATCH	3	44 - 46	Integer
Laboratory type code	TYPE	2	48 - 49	Integer
Instrumental result	RESULT	7	51 - 57	Real
Final dilution	DILUTE	3	59 - 61	Real
Dilution factor	FACTOR	3	63 - 65	Real
Sub-sample mass	SUB_MASS	6	67 - 72	Real
Total sample mass	TOT_MASS	6	74 - 80	Real
Sample dimension 1	DIMEN_1	3	82 - 84	Real
Sample dimension 2	DIMEN_2	3	86 - 88	Real
True conc. or spike wt.	SPIKE	6	90 - 95	Real
Lead per mass	MG_GRAM	7	97 -103	Real
Lead per cm^2	MG_CM2	8	105 -112	Real
Detection limit	DETECT	1	114	Integer

8.2 LAB_ICP: Data Definitions

OMIT: Flags records to be omitted from the primary study analyses. See section 10.0 for a discussion about the omission flag.

IDNO: Identification number assigned to each sample location (see section 1.1)

DUPE: A code of 0 indicates the sample is a field primary paint-chip sample, while a code of 1 indicates that the sample is a field duplicate sample. For a discussion about field duplicates see section 3.2.2.3 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report*.

RUN_NO: Number assigned by the laboratory to the sample run.

SAMPLE: Laboratory sample description.

NAME: Codes 1 through 9 were assigned to the individuals who collected the paint-chip samples.

DATE_C: The date that the paint-chip sample was collected; recorded in the following format: MMDDYY.

DATE_A: The date that the paint was analyzed in the laboratory is stored using the following format: MMDDYY.

BATCH: Number assigned by the laboratory to the sample batch.

TYPE: Codes describing the type of laboratory sample. For a discussion about paint collection and laboratory analysis design elements see sections 3.2.2 and 3.3.2 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report*. The following codes were assigned to each sample type.

Code	Type of Sample
0	Laboratory primary sample
1	Laboratory duplicate sample
2	Field blank sample
3	Lab method blank
4	AIHA ELPAT blind sample
5	AIHA ELPAT blind duplicate sample
6	NIST blind reference material
7	Standard not used for lead
8	Calibration standard

8.2 LAB_ICP: Data Definitions (cont.)

Code	Type of Sample
9	Interferant check standard (ICS) or initial calibration verification (ICV)
10	Continuing calibration verification (CCV)
11	Continuing calibration blank (CCB) or initial calibration blank (ICB)
12	Used for instrumental detection limit calculation
13	Spiked sample
14	Duplicate Spiked Sample
15	Sample has characteristics undesirable for analysis (details given in section 10)

RESULT: Instrumental response in microgram (µg) per sample. For a discussion about laboratory analysis design elements see section 3.3.2 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report*.

DILUTE: Final dilution volume in milliliters. For a discussion about laboratory analysis design elements see section 3.3.2 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report*.

FACTOR: Dilution factors. For a discussion about laboratory analysis design elements see section 3.3.2 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report*.

SUB_MASS: Subsample mass in grams. For a discussion about laboratory analysis design elements see section 3.3.2 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report*.

TOT_MASS: Total sample mass in grams. For a discussion about paint-chip sample collection see section 3.2.2.1 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report*.

DIMEN_1: The first dimension of the rectangular area from which the paint-chip sample was taken. For a discussion about paint-chip collection size see section 3.2.2.1 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report*.

8.2 LAB_ICP: Data Definitions (cont.)

DIMEN_2: The second dimension of the rectangular area from which the paint-chip sample was taken. For a discussion about paint-chip collection size see section 3.2.2.1 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report*.

SPIKE: True concentration or spike weight.

MG_GRAM: Laboratory analysis ICP result reported as milligram lead per gram of sample mass. For a discussion laboratory reported results see section 3.3.2.1 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report*.

MG_CM2: Laboratory analysis ICP result reported in area units as milligram lead per square centimeter (mg/cm^2). For a discussion about laboratory reported results see section 3.3.2.1 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report*.

DETECT: Code to indicate if the reported result is below the instrumental detection limit. If the code is equal to 0 then the reported result exceeds the detection limit. If the code is equal to 1 then the reported result is below the detection limit. For a discussion about laboratory analysis design elements see sections 3.3.2 and 4.4.1 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report*.

9.0 HUM_TEMP: HUMIDITY AND TEMPERATURE DATA SET

There are five (5) data fields per record in the humidity and temperature (HUM_TEMP) data set containing data collected in Denver and Philadelphia. Humidity and temperature data collected in Louisville is stored in the PLT_CTRL data set described above. Descriptions and names of the data fields in the HUM_TEMP data set along with their widths, columns, and variable types are given in section 9.1. Section 9.2 provides data definitions for each data field identified in section 9.1.

9.1 HUM_TEMP: Standard Record Layout

Description	Name	Width	Columns	Type
Date of observation	DATE	8	1 - 8	Date
Time of observation	TIME	5	10 - 14	Time
Address code	ADDRESS	2	16 - 17	Integer
Temperature	TEMP	4	19 - 22	Real
Humidity	HUMID	4	24 - 27	Real

9.2 HUM_TEMP: Data Definitions

DATE: The date that the observations were made; recorded in the following format: MM/DD/YY.

TIME: The four digit 24 hour clock military time (including the colon) is the start time of the series of readings.

ADDRESS: The codes 1 through 12 were used to indicate addresses in Denver and Philadelphia. In Denver, where ten single-family houses were tested, the codes 1 through 10 were used to designate the ten addresses. In Philadelphia, where the eight units tested were at two addresses, the codes 11 and 12 were used to designate the two addresses.

TEMP: Temperature observation recorded whenever control readings were taken.

HUMID: Humidity observation recorded whenever control readings were taken.

10.0 RECORDS WHICH CHANGED DUE TO DATA COMPARISONS

Several of the XRF instruments that were used in this study store data electronically. Four of these instruments, the Pb Analyzer, the MAP-3 instruments, and the X-MET 880 provided electronically stored data which were then compared to the original hand-written field data. A listing of all electronically stored data is not given here, but data that changed due to errors identified through comparisons of hand-written data with the electronically stored data are listed below. XRF instruments are identified by their field classification, as described in previous sections. The column headings are as follows: IDNO is the identification number discussed in previous sections; "Reading" identifies the type of XRF reading which was changed due to the comparison; "Incorrect Value" is the incorrect XRF reading from the original hand-written data sheet; "Correct Value" is the correct XRF reading taken from the XRF instruments' electronically stored results; and "Data Type" is either standard, control, or special which identifies the type of data that was affected by the change. An entry of "miss" in the "Incorrect Value" column indicates that the datum was missing from the original hand-written field data sheet. The data sets described in sections 4 through 9 of this document contain only the corrected data from the lists given below. For a detailed discussion about data comparisons see section 7.3.3 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report*.

---------------------------- XRF_ID = **X-MET 880** -------------------------

SAMPLE IDNO	READING	INCORRECT VALUE	CORRECT VALUE	DATA TYPE
5	Pnt_2	0.2550	0.1990	Standard
5	Pnt_3	0.1990	0.2260	Standard
207	Pnt_1	0.6490	0.6460	Standard
234	Pnt_3	0.0590	0.0390	Standard
273	Red_2	1.0630	1.0600	Standard
322	Pnt_3	0.4440	0.0440	Standard
443	Pnt_3	0.0260	0.0280	Standard
535	Pnt_3	0.0590	0.0570	Standard
554	Red_2	1.0800	1.0880	Standard
572	Red_1	1.0240	1.1240	Standard
589	Yel_1	3.6010	3.6020	Control
635	Red_3	1.1000	1.1100	Standard
1240	Time	10:51	10:57	Standard
1253	Red_2	1.0600	1.0060	Standard
1258	Red_1	1.1100	1.0110	Standard
1313	Red_2	1.0290	1.0510	Standard

10.0 RECORDS WHICH CHANGED DUE TO DATA COMPARISONS (cont.)

--------------------- XRF_ID = **X-MET 880 (continued)** ---------------

SAMPLE IDNO	READING	INCORRECT VALUE	CORRECT VALUE	DATA TYPE
1323	Red_2	1.0600	1.0680	Standard
1327	Red_2	1.0450	1.0540	Standard
1332	Red_3	1.0590	1.0490	Standard
1340	Pnt_1	0.1060	0.1600	Standard
1357	Red_1	1.0450	1.0540	Standard
1371	Red_3	1.0200	1.0230	Control
1372	Yel_1	3.6730	3.6700	Control
1375	Red_2	1.0270	1.0240	Control
1413	Red_1	1.0100	1.0180	Standard
1426	Red_3	0.9760	0.9700	Standard
1518	Bare_3	0.0280	0.0250	Standard
1526	Red_1	0.0960	0.9600	Standard
1608	Pnt_1	0.1030	0.1300	Standard
1645	Red_1	1.6760	1.0760	Standard
1660	Red_2	1.0330	1.0530	Control
1661	Yel_1	3.6700	3.6730	Control
1715	Pnt_3	0.0830	0.0800	Standard
1729	Red_2	1.0280	1.0260	Standard
1731	Red_3	1.0110	1.0610	Standard
1742	Red_1	1.0640	1.0840	Standard
1814	Pnt_1	0.0330	0.0390	Standard
1816	Pnt_3	0.0580	0.0590	Standard
1819	Pnt_3	0.0310	0.0390	Standard
1850	Red_1	0.0910	0.8910	Standard
1917	Pnt_3	0.0690	0.0670	Standard
1922	Red_2	0.9910	0.9990	Standard
1923	Red_1	1.0030	1.0300	Standard
1958	Red_1	0.9850	0.9890	Standard

------------------------ XRF_ID = **MAP-3 K-shell (I)** ------------------------

SAMPLE IDNO	READING	INCORRECT VALUE	CORRECT VALUE	DATA TYPE
35	Red_3	0.8970	0.8790	Standard
43	Red_3	1.1811	1.8110	Standard
82	Red_3	0.6050	0.6040	Control
90	Yel_3	3.8540	3.8450	Control
112	Red_2	1.9430	1.9480	Standard
116	Pnt_1	0.8280	0.8200	Standard
127	Red_1	0.0730	0.8370	Special
150	Red_2	1.7080	1.7060	Standard

-------------------- XRF_ID = **MAP-3 K-shell (I) (continued)** ---------------

SAMPLE IDNO	READING	INCORRECT VALUE	CORRECT VALUE	DATA TYPE
185	Red_2	0.8430	0.8480	Control

10.0 RECORDS WHICH CHANGED DUE TO DATA COMPARISONS (cont.)

190	Yel_2	3.7950	3.7940	Control
191	Yel_1	2.1700	2.7100	Control
193	Yel_2	3.3080	3.3040	Control
215	Pnt_2	0.3430	0.3420	Standard
218	Pnt_1	2.9090	2.9070	Standard
218	Pnt_3	3.4300	3.4340	Standard
232	Red_1	0.4940	0.4970	Standard
233	Pnt_3	0.5500	0.5000	Standard
261	Pnt_2	0.8280	0.8270	Standard
272	Red_3	0.6360	0.6380	Standard
283	Yel_3	2.8520	2.8530	Control
309	Red_3	1.9790	1.4790	Standard
333	Pnt_3	0.0650	0.0600	Standard
336	Red_1	1.0030	1.0830	Special
357	Red_3	1.8730	0.8730	Standard
367	Red_3	0.5430	0.5460	Standard
373	Red_2	1.7630	1.7640	Standard
381	Yel_2	3.0520	3.0530	Control
385	Bare_1	1.9190	0.0000	Control
414	Red_1	1.1920	1.1910	Standard
432	Red_3	1.3020	1.3030	Standard
442	Red_3	0.7920	0.7940	Standard
448	Pnt_2	0.8820	0.4820	Standard
448	Pnt_3	0.5400	0.4500	Standard
451	Red_1	1.0680	1.0600	Standard
462	Pnt_2	0.4240	0.4250	Standard
483	Red_2	1.1420	1.1450	Control
484	Yel_1	3.5950	2.5950	Control
488	Red_1	0.7080	0.7030	Control
522	Red_1	1.6340	1.0000	Standard
580	Bare_2	0.1590	0.1500	Control
593	Yel_3	3.0640	3.0610	Control
666	Red_1	1.6190	1.6490	Standard
672	Red_2	0.0170	0.1070	Standard
678	Pnt_3	0.4660	0.4640	Standard
708	Pnt_2	0.0070	0.0090	Standard
716	Pnt_1	0.3430	0.3420	Standard
739	Red_3	1.7870	1.7830	Standard
748	Pnt_1	17.3570	17.3520	Standard
749	Pnt_2	25.0280	25.2080	Standard
754	Pnt_1	25.6390	25.3690	Standard
775	Pnt_2	22.3330	22.2330	Standard
784	Bare_3	0.1290	0.1210	Control

-------------------- XRF_ID = **MAP-3 K-shell (I) (continued)** ---------------

SAMPLE IDNO	READING	INCORRECT VALUE	CORRECT VALUE	DATA TYPE
815	Pnt_3	0.8800	0.4800	Standard
847	Red_1	1.3300	1.3320	Standard
876	Red_3	0.3430	0.3450	Standard
880	Yel_3	3.1690	3.1670	Control
908	Red_2	2.0250	2.0230	Standard
917	Red_2	1.5410	1.4510	Standard
934	Red_3	miss	1.0110	Standard

10.0 RECORDS WHICH CHANGED DUE TO DATA COMPARISONS (cont.)

935	Red_1	1.1650	1.1600	Standard
974	Pnt_3	2.2450	2.2410	Standard
1209	Pnt_2	0.0500	-0.0500	Standard
1235	Red_2	0.2140	0.2410	Standard
1262	Bare_1	-0.8550	0.8550	Control
1263	Red_1	0.5630	0.5620	Control
1265	Bare_1	-1.0550	-1.0570	Control
1273	Red_1	0.9880	0.9830	Control
1315	Pnt_1	0.2390	0.3290	Standard
1321	Red_3	1.2000	1.2020	Standard
1325	Pnt_1	0.2800	-0.2800	Standard
1356	Pnt_2	1.7310	0.7310	Standard
1361	Bare_1	-0.1560	0.1560	Control
1429	Pnt_1	0.3110	-0.3110	Special
1436	Pnt_3	3.3570	3.3750	Standard
1461	Bare_2	-0.1730	0.1730	Control
1462	Bare_3	-0.4880	-0.4480	Control
1507	Pnt_1	-1.6750	-1.6790	Standard
1507	Bare_1	1.9210	-1.9210	Special
1518	Pnt_2	-0.8720	0.8720	Standard
1533	Pnt_1	1.7760	1.7730	Standard
1543	Red_2	1.0000	1.0080	Standard
1569	Red_2	0.0920	0.0930	Control
1611	Pnt_1	-0.1900	-0.1090	Standard
1633	Bare_1	0.6680	0.6620	Special
1730	Pnt_3	-0.4140	-0.4110	Standard
1760	Yel_3	3.6200	3.6230	Control
1761	Bare_1	-0.4470	-0.4490	Control
1765	Bare_1	-1.0440	-1.0040	Control
1805	Pnt_3	0.5950	0.5920	Standard
1806	Pnt_2	-0.3300	-0.3330	Standard
1826	Red_1	0.3940	0.3910	Standard
1862	Yel_3	3.4940	3.4930	Control
1863	Yel_3	3.1040	3.1050	Control
1873	Red_1	0.0390	0.0390	Control
1936	Pnt_3	1.0570	1.6570	Standard
1944	Red_3	1.2800	1.0000	Standard

------------------------- XRF_ID = **MAP-3 L-shell (I)** ----------------------

SAMPLE IDNO	READING	INCORRECT VALUE	CORRECT VALUE	DATA TYPE
5	Red_1	1.4640	1.4620	Standard
36	Red_3	1.3060	1.3130	Standard
59	Red_3	1.2180	1.2810	Standard
72	Pnt_1	0.6110	0.6610	Standard
75	Red_3	1.1140	1.1110	Standard
85	Red_3	1.2330	1.2230	Control
91	Red_1	1.2300	1.2380	Control
94	Red_1	1.0050	1.0850	Control
113	Pnt_3	0.8970	0.8790	Standard
162	Red_3	1.1500	1.1580	Standard
174	Red_1	1.1600	1.1680	Standard
180	Yel_2	2.8730	2.8780	Control

10.0 RECORDS WHICH CHANGED DUE TO DATA COMPARISONS (cont.)

183	Yel_2	3.3300	3.3330	Control
185	Red_1	1.2310	1.2320	Control
192	Yel_3	3.8890	2.8890	Control
192	Red_1	0.9710	0.9510	Control
216	Pnt_1	3.8380	3.3860	Standard
225	Pnt_2	5.9270	5.9570	Standard
232	Red_3	1.1390	1.1300	Standard
308	Pnt_3	0.8900	0.8980	Standard
312	Pnt_2	0.0570	0.0470	Standard
318	Pnt_1	2.2500	2.5200	Standard
332	Red_1	1.4760	1.4780	Standard
356	Pnt_1	-0.0500	0.0500	Standard
359	Pnt_2	0.3940	0.3970	Standard
370	Red_2	1.3640	1.3440	Standard
373	Red_1	1.3200	1.3270	Standard
383	Yel_2	3.1630	3.1600	Control
385	Bare_1	0.1720	0.0000	Control
395	Red_3	1.3120	1.1320	Control
405	Red_3	1.4940	1.4440	Standard
415	Red_2	1.1910	1.0000	Standard
555	Red_1	1.1270	1.1250	Special
618	Red_2	1.0980	1.0910	Standard
622	Red_1	1.1810	1.1840	Standard
631	Red_2	1.2690	1.2610	Standard
666	Red_1	1.1740	1.1790	Standard
669	Pnt_1	0.2930	0.3930	Special
670	Red_3	1.2530	1.2500	Standard
672	Red_1	1.2190	1.2910	Standard

---------------------- XRF_ID = **MAP-3 L-shell (I) (continued)** -------------

SAMPLE IDNO	READING	INCORRECT VALUE	CORRECT VALUE	DATA TYPE
680	Yel_1	2.9950	2.9970	Control
680	Yel_3	3.1000	3.1080	Control
688	Red_1	0.9900	0.9930	Control
745	Pnt_2	1.3880	1.3800	Standard
747	Red_2	1.3410	1.3110	Standard
751	Pnt_2	0.3720	0.3700	Standard
774	Pnt_3	0.5430	0.5230	Standard
775	Pnt_3	0.5200	0.5700	Standard
780	Yel_3	3.9530	2.9530	Control
781	Yel_3	3.3080	3.3010	Control
811	Red_1	1.1460	1.1470	Standard
812	Red_1	1.2070	1.2080	Standard
817	Red_1	0.1140	1.1140	Standard
845	Red_3	1.3110	1.3190	Standard
847	Red_2	1.4010	1.4090	Standard
853	Pnt_3	3.0000	0.3000	Standard
877	Pnt_1	0.0000	0.1070	Standard
877	Pnt_3	0.0780	0.0720	Standard
888	Red_3	1.1610	1.1650	Control

10.0 RECORDS WHICH CHANGED DUE TO DATA COMPARISONS (cont.)

934	Red_3	0.0000	1.2000	Standard
948	Red_2	1.2310	1.2350	Standard
959	Red_2	1.2820	1.2870	Standard
1262	Bare_2	-0.1410	0.1410	Control
1263	Bare_3	-0.1060	0.1060	Control
1316	Pnt_3	0.4740	0.4750	Standard
1352	Pnt_1	-0.0180	0.0180	Standard
1361	Yel_3	3.2630	3.2620	Control
1361	Bare_1	-0.1680	-0.1860	Control
1363	Bare_2	-0.1560	0.1200	Control
1428	Pnt_1	-0.0940	-0.0960	Special
1459	Pnt_1	0.2280	0.2270	Standard
1505	Bare_1	-0.1330	-0.1300	Special
1507	Pnt_2	-0.0980	0.0980	Standard
1507	Red_3	1.2760	1.2790	Standard
1532	Bare_1	-0.1230	-0.1270	Special
1538	Pnt_3	-0.0200	-0.0230	Standard
1540	Red_3	1.1400	1.1480	Standard
1545	Red_1	1.1900	1.1100	Special
1560	Bare_3	-0.1680	0.1680	Control
1562	Bare_3	-0.2310	-0.2320	Control
1605	Pnt_2	-0.2740	-0.2040	Standard

---------------------- XRF_ID = **MAP-3 L-shell (I) (continued)** -------------

SAMPLE IDNO	READING	INCORRECT VALUE	CORRECT VALUE	DATA TYPE
1610	Pnt_3	1.0990	0.1990	Standard
1616	Pnt_1	-0.1100	-0.1110	Standard
1622	Red_3	1.2960	1.3960	Standard
1626	Red_1	1.1740	1.1750	Standard
1642	Pnt_1	0.2120	0.2100	Standard
1667	Yel_3	3.4620	3.4820	Control
1668	Yel_3	3.2810	3.2890	Control
1713	Red_3	0.9430	0.9420	Standard
1720	Pnt_3	-0.1670	-0.1630	Standard
1720	Red_1	1.0190	1.0110	Standard
1742	Red_3	1.4010	1.1010	Standard
1762	Bare_3	-0.2250	0.2250	Control
1764	Bare_2	-0.1690	-0.1670	Control
1806	Pnt_1	-0.3260	-0.3270	Standard
1806	Red_1	1.0760	1.2760	Standard
1808	Red_1	1.1850	1.1870	Special
1843	Red_2	1.1430	1.1420	Standard
1861	Bare_3	-0.2250	-0.2240	Control
1865	Red_3	0.0820	1.0820	Control
1877	Yel_2	3.3370	3.4370	Control
1923	Red_3	1.2320	1.2300	Standard
1960	Bare_3	-0.1460	-0.1420	Control
1963	Red_3	1.2180	1.2810	Control
1963	Bare_2	-0.1250	0.1250	Control
1964	Bare_2	-0.1210	-0.2110	Control
1965	Bare_2	-0.1530	-0.1520	Control

10.0 RECORDS WHICH CHANGED DUE TO DATA COMPARISONS (cont.)

------------------------ XRF_ID = **MAP-3 K-shell (II)** ---------------------

SAMPLE IDNO	READING	INCORRECT VALUE	CORRECT VALUE	DATA TYPE
55	Red_1	1.6260	1.6250	Standard
57	Red_2	0.1830	0.8350	Standard
58	Pnt_2	0.4410	-0.4410	Standard
80	Bare_3	0.2160	-0.2160	Control
83	Bare_1	0.0360	-0.0360	Control
124	Red_3	0.4640	0.6460	Standard
142	Pnt_2	1.7630	0.7630	Standard
145	Pnt_1	1.8660	1.8860	Standard
185	Red_3	0.1080	0.0180	Control
281	Bare_1	0.5240	-0.5240	Control

------------------- XRF_ID = **MAP-3 K-shell (II) (continued)** --------------

SAMPLE IDNO	READING	INCORRECT VALUE	CORRECT VALUE	DATA TYPE
282	Bare_2	0.9670	-0.9670	Control
283	Yel_1	3.6760	3.6730	Control
284	Bare_1	0.4510	-0.4510	Control
284	Bare_3	1.7160	-1.7160	Control
285	Yel_3	0.1060	-0.1060	Control
383	Bare_3	-0.1150	0.1150	Control
405	Red_1	2.1870	2.1820	Standard
417	Pnt_3	1.7670	1.7650	Standard
420	Pnt_2	1.2670	1.2620	Standard
422	Pnt_3	0.6230	-0.6230	Standard
433	Pnt_3	0.9170	1.9170	Standard
441	Red_2	0.6030	0.9030	Standard
449	Pnt_3	-0.0720	0.0720	Standard
449	Pnt_1	0.3250	0.0000	Special
451	Red_1	0.9990	0.9940	Special
456	Pnt_3	0.3840	-0.3840	Standard
467	Pnt_1	-0.3840	0.3840	Standard
472	Pnt_2	0.3000	0.3800	Standard
474	Pnt_3	-0.6200	0.6200	Standard
480	Bare_2	0.0000	0.4520	Control
480	Bare_2	0.1180	0.5180	Control
481	Yel_1	2.5340	2.8340	Control
483	Red_3	0.7210	0.7290	Control
483	Yel_2	3.2160	3.2610	Control
488	Yel_1	3.2510	3.2570	Control
489	Bare_2	0.0000	0.1700	Control
492	Red_1	1.3250	1.3350	Control
510	Bare_1	0.7230	0.2200	Special
516	Pnt_1	0.9910	0.0910	Standard
526	Pnt_1	0.4440	0.0440	Standard
541	Pnt_3	-0.1380	0.1380	Standard

10.0 RECORDS WHICH CHANGED DUE TO DATA COMPARISONS (cont.)

544	Red_3	1.4920	1.4970	Standard
560	Bare_1	0.5250	0.5230	Special
562	Red_2	1.2290	1.1290	Standard
562	Red_3	1.2260	1.1260	Standard
576	Pnt_2	1.2330	-1.2330	Standard
582	Bare_3	1.1230	-1.1230	Control
583	Bare_2	0.0070	0.0770	Control
584	Yel_3	2.2440	2.3440	Control
588	Bare_1	0.0370	0.0370	Control
592	Bare_2	1.0460	1.0460	Control
624	Red_3	0.8840	0.8440	Standard

------------------- XRF_ID = **MAP-3 K-shell (II) (continued)** -------------

SAMPLE IDNO	READING	INCORRECT VALUE	CORRECT VALUE	DATA TYPE
626	Red_3	2.5500	2.2500	Standard
644	Pnt_3	-0.2930	0.2930	Standard
661	Red_3	1.9920	1.1920	Standard
664	Pnt_3	-0.7080	0.7080	Standard
669	Red_2	1.2380	1.2360	Standard
674	Pnt_1	0.9590	-0.9590	Standard
680	Bare_2	-0.3540	0.3540	Control
681	Bare_3	0.2590	-0.2590	Control
681	Bare_2	0.1460	-0.1460	Control
681	Bare_2	0.1710	-0.1710	Control
681	Bare_1	-0.1000	0.1000	Control
682	Yel_2	3.0870	3.8870	Control
685	Yel_1	3.2240	3.3240	Control
685	Red_3	0.6730	0.9730	Control
685	Bare_3	2.7250	-2.7250	Control
686	Bare_3	0.4140	-0.4140	Control
688	Bare_1	0.2330	-0.2330	Control
692	Bare_2	-0.5890	0.5890	Control
692	Bare_3	-0.1990	0.1990	Control
710	Pnt_2	0.0530	0.5530	Standard
720	Red_3	5.2460	5.2430	Standard
733	Pnt_1	10.9990	10.9900	Standard
734	Pnt_3	6.5050	6.5060	Standard
744	Pnt_3	6.6940	6.7940	Standard
752	Pnt_1	3.4440	3.3440	Standard
756	Red_2	2.6970	2.6960	Standard
757	Red_3	2.3310	2.1310	Standard
761	Pnt_1	11.7100	11.7710	Standard
761	Pnt_2	10.1670	10.1690	Standard
761	Pnt_3	10.4940	10.1690	Standard
764	Pnt_2	0.8680	-0.8680	Standard
769	Pnt_2	1.0480	-1.0480	Standard
779	Red_1	1.0110	0.1100	Special
780	Bare_1	-0.0870	0.0870	Control
780	Bare_3	-0.1700	0.1700	Control
780	Bare_1	-0.2600	0.2600	Control
780	Bare_2	-0.3840	0.3840	Control
783	Bare_3	0.5410	-0.5410	Control
784	Bare_1	1.4870	-1.4870	Control

10.0 RECORDS WHICH CHANGED DUE TO DATA COMPARISONS (cont.)

788	Yel_1	3.6740	3.6770	Control
812	Pnt_1	1.2490	1.2250	Standard
823	Pnt_1	0.9560	-0.9560	Standard
826	Pnt_3	-0.5300	0.5300	Standard

------------------- XRF_ID = **MAP-3 K-shell (II) (continued)** --------------

SAMPLE IDNO	READING	INCORRECT VALUE	CORRECT VALUE	DATA TYPE
828	Pnt_2	0.7060	-0.7060	Standard
833	Pnt_2	0.4640	-0.4640	Standard
837	Pnt_1	-0.8890	0.0890	Standard
838	Red_1	1.2820	1.2870	Standard
839	Red_2	0.5190	-0.5190	Standard
850	Red_1	1.8480	1.8400	Standard
856	Pnt_2	-0.7230	0.7230	Standard
860	Pnt_1	-0.0050	0.0050	Standard
860	Pnt_3	0.2140	-0.2140	Standard
875	Pnt_2	-0.0940	0.0940	Standard
878	Pnt_1	-0.3050	0.3050	Standard
884	Bare_2	1.3770	-1.3770	Control
895	Yel_2	3.2330	3.2320	Control
905	Pnt_2	-0.0420	0.0420	Standard
906	Pnt_1	-1.4680	1.4680	Standard
906	Pnt_2	-0.3720	0.3720	Standard
906	Pnt_3	-0.2970	0.2970	Standard
907	Pnt_2	-0.8520	0.8520	Standard
907	Pnt_3	-0.6410	0.6410	Standard
908	Pnt_2	-1.8180	1.8180	Standard
908	Red_1	0.4940	0.4920	Standard
915	Pnt_2	-1.1340	1.1340	Standard
919	Pnt_1	-0.4680	0.4680	Standard
920	Pnt_2	-0.5140	0.5140	Standard
920	Pnt_3	-0.6860	0.6860	Standard
920	Red_1	-0.5570	0.5570	Standard
922	Pnt_2	-1.6380	1.6380	Standard
923	Pnt_2	0.4200	-0.4200	Standard
934	Pnt_1	0.4650	-0.4650	Standard
936	Pnt_1	0.8490	-0.8490	Standard
937	Red_2	0.4420	0.0420	Standard
944	Pnt_1	-0.4930	0.4930	Standard
949	Pnt_2	-0.3010	0.3010	Standard
959	Pnt_3	2.3350	-2.3350	Standard
960	Pnt_2	1.3510	-1.3510	Standard
970	Pnt_1	-0.8950	0.8950	Standard
975	Pnt_1	-0.0590	0.0590	Standard
976	Red_2	1.5540	1.1540	Standard
980	Bare_1	-0.6570	0.6570	Control
981	Bare_3	0.4420	-0.4420	Control
982	Bare_3	2.9920	-2.9920	Control
983	Bare_1	-0.3820	0.3820	Control
984	Bare_1	1.9930	-1.9930	Control

------------------- XRF_ID = **MAP-3 K-shell (II) (continued)** --------------

10.0 RECORDS WHICH CHANGED DUE TO DATA COMPARISONS (cont.)

SAMPLE IDNO	READING	INCORRECT VALUE	CORRECT VALUE	DATA TYPE
984	Red_1	0.0490	-0.0490	Control
985	Red_3	0.1170	0.0170	Control
985	Bare_3	1.3030	-1.3030	Control
988	Bare_3	2.2920	-2.2920	Control
991	Bare_1	-0.4580	0.4580	Control
1235	Red_1	-0.1970	-0.1790	Standard
1236	Pnt_2	-1.4200	-3.4200	Standard
1238	Pnt_2	-1.1120	-1.1220	Standard
1241	Pnt_3	0.1750	0.7650	Standard
1245	Red_2	0.2020	-0.2020	Standard
1251	Red_3	0.7200	0.7210	Standard
1252	Red_1	0.4900	0.4970	Standard
1260	Red_3	-0.9820	0.9820	Control
1262	Red_3	0.2270	-0.2270	Control
1262	Bare_3	-0.3330	-0.3830	Control
1263	Red_1	1.1500	1.1580	Control
1263	Bare_1	-0.0740	0.0740	Control
1264	Red_1	-1.1020	-1.1030	Control
1265	Red_3	0.2500	0.2580	Control
1276	Red_3	0.6270	0.6370	Control
1306	Pnt_3	-0.3250	0.3250	Standard
1313	Pnt_2	0.0430	-0.0430	Standard
1314	Pnt_3	0.1950	-0.1950	Standard
1323	Pnt_2	-1.5310	-1.5320	Standard
1329	Pnt_1	-0.3250	-0.2350	Standard
1335	Pnt_3	0.7910	-0.7910	Standard
1336	Pnt_1	-0.7530	-0.7130	Special
1341	Red_1	0.0160	1.0160	Standard
1344	Pnt_1	0.7150	-0.7150	Standard
1353	Red_3	0.6070	0.7060	Standard
1356	Pnt_1	0.6500	0.6250	Special
1360	Bare_1	0.5400	0.4500	Control
1362	Yel_3	2.9650	2.9560	Control
1363	Yel_1	2.9880	2.7880	Control
1376	Bare_3	-0.2610	0.2610	Control
1405	Pnt_2	0.0570	-0.0570	Standard
1418	Pnt_3	-0.2990	-0.2290	Standard
1428	Pnt_3	-0.7610	-0.6710	Standard
1455	Pnt_2	1.3860	1.8760	Standard
1460	Yel_1	1.1330	2.1330	Control
1460	Bare_3	-0.0490	-0.0480	Control
1461	Yel_1	2.6900	2.6980	Control
1462	Yel_3	2.8260	3.8260	Control

------------------- XRF_ID = **MAP-3 K-shell (II) (continued)** --------------

SAMPLE IDNO	READING	INCORRECT VALUE	CORRECT VALUE	DATA TYPE
1465	Red_1	-0.3560	0.3560	Control
1466	Bare_2	0.2170	-0.2170	Control
1468	Bare_1	0.4300	-0.4300	Control
1474	Red_2	-0.7640	0.7640	Control

10.0 RECORDS WHICH CHANGED DUE TO DATA COMPARISONS (cont.)

1508	Pnt_3	-0.2000	-0.2800	Standard
1510	Pnt_1	-0.0670	-0.6070	Standard
1512	Pnt_2	-0.0780	0.0780	Standard
1512	Bare_1	-1.1570	-1.2570	Special
1513	Red_3	miss	0.5270	Standard
1518	Bare_1	-0.0540	-2.0540	Special
1519	Red_3	1.2430	1.3430	Standard
1524	Bare_1	-1.8220	-1.0220	Special
1527	Red_3	0.4430	0.4000	Standard
1528	Red_2	1.5010	1.5110	Standard
1539	Bare_1	-0.6290	0.6290	Special
1549	Bare_1	-0.3640	0.6340	Special
1552	Red_1	1.9310	0.9310	Standard
1559	Pnt_1	2.0970	0.0970	Standard
1560	Bare_3	-0.0450	-0.0540	Control
1561	Red_3	0.0740	1.0740	Control
1562	Yel_2	4.5930	4.5980	Control
1574	Yel_2	2.9200	3.9200	Control
1605	Red_2	1.3440	1.3340	Standard
1612	Red_1	-0.7620	-0.6720	Standard
1620	Red_1	-1.8550	1.8550	Standard
1623	Pnt_1	-0.2140	0.2140	Standard
1631	Red_3	1.1700	1.1790	Standard
1635	Pnt_2	0.4300	0.4320	Standard
1637	Pnt_1	2.7310	2.7300	Standard
1645	Red_2	1.1970	1.1960	Standard
1656	Pnt_3	-0.3210	0.3210	Standard
1657	Red_1	0.1930	-0.1930	Special
1658	Pnt_2	0.7140	0.7940	Standard
1659	Red_1	0.0520	-0.0520	Standard
1660	Yel_1	0.0900	3.0900	Control
1661	Bare_1	0.4350	-0.4350	Control
1662	Red_1	-1.1360	-0.1360	Control
1663	Bare_1	-0.2890	-0.2980	Control
1664	Red_1	0.0030	-0.0030	Control
1667	Bare_2	0.4390	-0.4390	Control
1670	Bare_2	-0.3570	-0.3510	Control
1674	Red_2	-0.2360	-0.3260	Control
1674	Bare_1	-0.8210	-1.8210	Control

------------------- XRF_ID = **MAP-3 K-shell (II) (continued)** --------------

SAMPLE IDNO	READING	INCORRECT VALUE	CORRECT VALUE	DATA TYPE
1675	Yel_1	3.4010	3.4100	Control
1675	Red_1	3.7710	0.7710	Control
1707	Bare_1	1.6100	0.6100	Special
1708	Red_3	0.5620	0.6520	Standard
1726	Red_1	-0.1670	-0.1690	Standard
1737	Red_3	0.4870	0.4860	Standard
1745	Red_1	0.0600	1.0600	Standard
1747	Pnt_1	0.4710	0.7410	Standard
1747	Pnt_3	0.3830	0.8380	Standard
1748	Pnt_1	0.7260	-0.7260	Standard
1761	Bare_2	-0.4510	-0.4590	Control

10.0 RECORDS WHICH CHANGED DUE TO DATA COMPARISONS (cont.)

1763	Bare_1	0.2880	-0.2880	Control
1765	Yel_2	3.1520	4.1520	Control
1771	Yel_3	2.5070	2.5170	Control
1772	Red_1	0.4800	0.8400	Control
1805	Pnt_2	1.1920	0.1920	Standard
1805	Pnt_3	3.0090	-3.0990	Standard
1819	Pnt_1	0.2810	-0.2810	Special
1821	Pnt_2	-0.4950	-1.4950	Standard
1836	Pnt_3	-0.0750	-0.7550	Standard
1860	Yel_2	3.1060	3.1960	Control
1861	Yel_2	2.5190	2.5090	Control
1861	Yel_2	2.2740	3.2740	Control
1863	Bare_1	-0.3400	-0.3040	Control
1871	Yel_2	2.6760	3.6760	Control
1906	Pnt_1	-0.0880	0.0880	Standard
1914	Pnt_2	1.3350	-1.3350	Standard
1915	Pnt_3	1.5280	-1.5280	Standard
1915	Pnt_1	-1.2490	-1.2190	Special
1951	Red_3	1.4380	1.2380	Standard
1954	Red_1	2.0510	2.0570	Standard
1961	Bare_2	0.1030	-0.1030	Control
1963	Bare_3	-0.0670	0.0670	Control
1964	Bare_1	-0.0610	-1.0610	Control
1964	Red_3	0.0060	-0.0060	Control
1965	Red_3	-0.3000	-0.3880	Control
1967	Red_3	0.9800	0.9080	Control
1974	Yel_1	2.1680	2.1670	Control

------------------------ XRF_ID = **MAP-3 L-shell (II)** ---------------------

SAMPLE IDNO	READING	INCORRECT VALUE	CORRECT VALUE	DATA TYPE
34	Red_3	0.2650	1.2650	Standard
41	Red_1	0.1800	1.0800	Standard
41	Red_3	1.1680	1.1660	Standard
55	Pnt_2	0.1760	-0.1760	Standard
58	Pnt_2	0.1260	-0.1260	Standard
59	Red_1	1.3700	1.3170	Special
60	Pnt_2	0.1850	-0.1850	Standard
82	Yel_2	2.5050	3.5050	Control
82	Red_1	1.1920	1.1990	Control
82	Yel_3	3.4430	3.4340	Control
89	Yel_2	1.3450	3.1450	Control
90	Yel_2	3.5160	3.5060	Control
92	Yel_2	3.4710	3.4170	Control
112	Red_1	1.2050	1.2500	Standard
113	Red_1	1.2040	1.2400	Standard
115	Red_3	1.4850	1.4050	Standard
122	Red_3	1.1620	1.0620	Standard
129	Red_3	1.3140	1.3480	Standard
134	Red_3	1.1160	1.1660	Standard
149	Pnt_2	0.0600	-0.0600	Standard
154	Pnt_1	0.1370	-0.1370	Standard
185	Red_2	1.0180	1.1010	Control

10.0 RECORDS WHICH CHANGED DUE TO DATA COMPARISONS (cont.)

280	Bare_2	0.1830	-0.1830	Control
281	Yel_1	3.2510	3.2910	Control
281	Bare_1	0.1630	-0.1630	Control
282	Bare_2	0.3580	-0.3580	Control
283	Red_2	1.5560	1.1560	Control
284	Bare_3	0.2350	-0.2350	Control
284	Yel_2	3.3560	3.3260	Control
408	Red_3	1.3270	1.3760	Standard
411	Red_2	1.2660	1.2650	Standard
420	Red_1	1.0850	1.1850	Standard
424	Red_2	1.2660	1.2760	Standard
432	Pnt_1	0.0270	-0.0270	Standard
433	Pnt_3	0.0620	0.6620	Standard
434	Red_1	1.3380	1.1380	Special
436	Red_3	1.1790	1.1760	Standard
438	Red_1	1.1900	1.1910	Standard
439	Red_3	1.2380	1.2370	Standard
443	Red_3	1.2470	1.2420	Standard
445	Pnt_3	0.1550	-0.1550	Standard
447	Pnt_2	0.0670	-0.0670	Standard
449	Pnt_1	0.1330	0.0000	Special
451	Pnt_3	0.0390	-0.0390	Standard

------------------- XRF_ID = **MAP-3 L-shell (II) (continued)** ---------------

SAMPLE IDNO	READING	INCORRECT VALUE	CORRECT VALUE	DATA TYPE
451	Red_1	1.1940	1.1910	Standard
455	Pnt_1	0.1350	-0.1350	Standard
456	Pnt_3	0.1650	-0.1650	Standard
462	Red_1	0.7430	0.7340	Standard
469	Pnt_1	0.0930	-0.0930	Standard
470	Pnt_2	0.0520	-0.0520	Standard
471	Red_2	1.5510	1.1510	Standard
473	Pnt_3	0.0330	-0.0330	Standard
474	Red_3	1.2530	1.2430	Standard
480	Yel_1	2.1960	2.1980	Control
480	Yel_2	3.4210	3.4310	Control
480	Bare_2	0.1840	-0.1840	Control
481	Yel_2	3.1950	3.1930	Control
482	Yel_1	3.4390	3.4790	Control
484	Red_3	1.2160	1.2190	Control
490	Red_2	1.8470	1.0470	Control
490	Bare_2	0.1180	-0.1180	Control
494	Yel_3	3.1100	3.1180	Control
509	Red_1	1.6400	1.6440	Special
510	Pnt_1	0.4560	0.5560	Standard
521	Red_1	1.4340	1.4330	Standard
527	Pnt_1	0.0940	-0.0940	Standard
528	Red_1	1.3200	1.4230	Special
535	Pnt_2	0.0820	-0.0820	Standard
545	Pnt_1	0.1130	-0.1130	Standard
550	Pnt_2	0.0380	0.0480	Standard
552	Red_3	0.1750	1.1750	Standard
554	Pnt_3	0.1440	-0.1440	Standard

10.0 RECORDS WHICH CHANGED DUE TO DATA COMPARISONS (cont.)

557	Pnt_3	0.1320	-0.1320	Standard
558	Red_3	1.2820	1.2860	Standard
576	Pnt_2	0.3080	-0.3080	Standard
580	Bare_3	0.1490	0.1490	Control
580	Red_2	1.0800	1.1800	Control
581	Bare_1	0.1560	-0.1560	Control
581	Yel_2	3.1980	3.1960	Control
582	Red_3	1.1650	1.1680	Control
582	Yel_1	3.1620	3.1690	Control
582	Bare_2	0.2100	-0.2100	Control
584	Yel_3	2.3880	3.3480	Control
584	Bare_1	0.2470	-0.2470	Control
585	Yel_1	3.5760	3.5260	Control
585	Bare_2	0.1170	-0.1170	Control
586	Bare_1	0.1240	-0.1240	Control

-------------------- XRF_ID = **MAP-3 L-shell (II) (continued)** ---------------

SAMPLE IDNO	READING	INCORRECT VALUE	CORRECT VALUE	DATA TYPE
586	Bare_2	0.1480	-0.1480	Control
587	Yel_3	0.0780	-0.0780	Control
588	Bare_1	0.1700	-0.1700	Control
592	Yel_2	3.2490	3.2290	Control
593	Yel_3	3.4420	3.4320	Control
611	Red_1	1.2080	1.2800	Special
616	Pnt_1	1.5150	1.4150	Standard
622	Pnt_1	2.3660	2.3690	Standard
622	Red_2	1.1950	1.1970	Standard
626	Pnt_1	0.2120	0.6120	Special
639	Red_2	1.1450	1.1440	Standard
642	Pnt_2	0.0560	-0.0560	Standard
642	Pnt_3	0.0760	-0.0760	Standard
644	Pnt_1	0.0360	-0.0360	Standard
646	Red_3	1.0850	1.0890	Standard
648	Pnt_3	0.0670	-0.0670	Standard
648	Red_3	1.3690	1.3190	Standard
649	Pnt_2	0.0890	-0.0890	Standard
653	Pnt_2	0.0680	-0.0680	Standard
669	Red_3	1.1220	1.1210	Standard
674	Pnt_1	0.0620	-0.0620	Standard
676	Pnt_3	-0.0120	0.0120	Standard
678	Red_1	1.3470	1.3570	Standard
680	Yel_2	2.5540	3.3540	Control
680	Yel_2	3.1750	3.1720	Control
681	Red_1	1.1220	1.1290	Control
681	Bare_2	0.1530	-0.1530	Control
681	Bare_2	0.1680	-0.1680	Control
683	Bare_2	0.1440	-0.1440	Control
683	Bare_2	0.1130	-0.1130	Control
684	Bare_2	0.2960	-0.2960	Control
684	Bare_3	0.2170	-0.2170	Control
684	Bare_3	0.1420	-0.1420	Control
685	Bare_3	0.2940	-0.2940	Control
686	Bare_3	0.1950	-0.1950	Control

10.0 RECORDS WHICH CHANGED DUE TO DATA COMPARISONS (cont.)

687	Bare_2	0.1460	-0.1460	Control
688	Bare_1	0.0870	-0.0870	Control
689	Bare_1	0.0690	-0.0690	Control
713	Pnt_1	0.1700	0.1070	Standard
714	Pnt_3	0.1440	0.1410	Standard
721	Pnt_3	0.0980	0.0890	Standard
723	Pnt_2	0.2560	0.2550	Standard
730	Pnt_1	1.4020	1.4520	Standard

-------------------- XRF_ID = **MAP-3 L-shell (II) (continued)** ----------------

SAMPLE IDNO	READING	INCORRECT VALUE	CORRECT VALUE	DATA TYPE
730	Pnt_2	1.4860	1.3860	Standard
733	Pnt_2	1.5330	1.1530	Standard
734	Red_3	1.2560	1.2580	Standard
738	Red_3	1.0450	1.0540	Standard
740	Red_2	1.6080	1.6300	Standard
746	Red_3	1.4700	1.4170	Standard
750	Pnt_2	0.2460	-0.2460	Standard
757	Red_2	1.3150	1.3130	Standard
758	Pnt_2	0.6250	0.6240	Standard
760	Red_2	-1.1100	1.1100	Standard
764	Pnt_2	0.1050	-0.1050	Standard
772	Red_3	1.1620	1.1520	Standard
780	Bare_2	0.1650	-0.1650	Control
780	Bare_1	0.1830	-0.1830	Control
787	Yel_2	2.6650	3.2650	Control
787	Red_1	1.1600	1.1610	Control
788	Yel_1	3.4420	3.4320	Control
790	Red_3	0.1420	1.1420	Control
795	Yel_3	3.3310	3.3210	Control
813	Pnt_3	0.1350	-0.1350	Standard
819	Pnt_3	0.1340	-0.1340	Standard
819	Red_3	0.1280	1.1280	Standard
824	Pnt_3	0.8810	0.0810	Standard
826	Pnt_3	-0.1330	0.1330	Standard
828	Pnt_2	0.1840	-0.1840	Standard
831	Red_2	1.0440	1.0400	Standard
836	Red_1	0.2020	1.2020	Standard
841	Red_3	1.3480	1.3280	Standard
843	Pnt_3	0.2270	0.2370	Standard
850	Pnt_2	-0.1210	0.1210	Standard
860	Pnt_3	0.1770	-0.1770	Standard
860	Red_1	1.3540	1.3430	Standard
869	Red_2	0.9390	0.9890	Standard
871	Red_3	1.3330	1.1330	Standard
873	Red_2	1.1440	1.1240	Standard
874	Red_1	1.0690	1.0610	Standard
875	Red_2	1.1680	1.1690	Standard
877	Pnt_1	-0.0190	0.0190	Standard
881	Yel_2	2.8590	3.8590	Control
881	Yel_2	2.2020	3.2020	Control

10.0 RECORDS WHICH CHANGED DUE TO DATA COMPARISONS (cont.)

-------------------- XRF_ID = **MAP-3 L-shell (II) (continued)** ----------------

SAMPLE IDNO	READING	INCORRECT VALUE	CORRECT VALUE	DATA TYPE
882	Bare_3	0.2360	-0.2360	Control
882	Yel_3	3.3080	3.3380	Control
884	Bare_2	0.2470	-0.2470	Control
884	Yel_3	4.5090	3.5090	Control
884	Yel_1	3.4090	3.4040	Control
884	Yel_3	3.3340	3.3430	Control
885	Yel_2	3.3390	3.3950	Control
905	Pnt_2	-0.1420	0.1420	Standard
905	Pnt_1	0.0970	0.0790	Special
906	Pnt_1	0.0000	1.1440	Standard
906	Pnt_2	0.0000	0.1820	Standard
906	Pnt_3	0.0000	0.1280	Standard
908	Pnt_1	1.6410	1.6510	Standard
908	Pnt_2	-1.8980	1.8980	Standard
908	Red_1	1.3410	1.3140	Standard
916	Red_1	1.1420	1.1820	Standard
918	Red_3	1.2330	1.2340	Standard
920	Red_1	-1.2490	1.2490	Standard
922	Pnt_2	-0.2840	0.2840	Standard
928	Pnt_2	0.1100	-0.1100	Standard
934	Pnt_1	0.1140	-0.1140	Standard
936	Pnt_1	0.2250	-0.2250	Standard
937	Pnt_1	0.2430	-0.2430	Standard
937	Red_1	1.1400	1.1040	Special
946	Red_3	1.2440	1.2450	Standard
952	Red_2	1.3950	1.3910	Standard
958	Red_2	1.1350	1.1390	Standard
959	Pnt_3	0.2650	-0.2650	Standard
963	Red_1	1.0740	1.0470	Standard
975	Pnt_1	-0.5550	0.5550	Standard
975	Red_2	1.2350	1.2340	Standard
976	Pnt_2	0.8170	0.8190	Standard
979	Pnt_2	0.2580	-0.2580	Standard
980	Yel_2	3.4360	3.3460	Control
981	Yel_3	3.4740	3.4720	Control
982	Yel_3	3.1980	3.1890	Control
982	Bare_3	0.2620	-0.2620	Control
983	Red_1	1.0820	1.2820	Control
984	Bare_1	0.3180	-0.3180	Control
984	Yel_2	3.6420	3.6320	Control
984	Yel_3	3.6300	3.6360	Control
985	Yel_1	3.1500	3.1510	Control
987	Yel_3	3.5520	3.3520	Control

-------------------- XRF_ID = **MAP-3 L-shell (II) (continued)** ----------------

SAMPLE IDNO	READING	INCORRECT VALUE	CORRECT VALUE	DATA TYPE

10.0 RECORDS WHICH CHANGED DUE TO DATA COMPARISONS (cont.)

988	Bare_3	0.2390	-0.2390	Control
992	Yel_2	3.0750	3.0730	Control
1240	Red_2	0.0600	1.0600	Standard
1243	Pnt_1	-0.5210	-0.1510	Standard
1243	Red_3	1.1040	1.1090	Standard
1260	Yel_3	3.1140	3.1440	Control
1260	Red_3	-0.9760	0.9760	Control
1260	Bare_3	-0.1700	-0.1070	Control
1261	Yel_3	2.3900	3.2900	Control
1263	Yel_3	3.5740	3.5710	Control
1263	Bare_2	-0.1320	-0.1520	Control
1265	Red_2	1.3380	1.3080	Control
1275	Yel_3	3.1270	3.7270	Control
1315	Pnt_2	0.0350	0.4350	Standard
1317	Red_3	-1.1760	1.1760	Standard
1321	Pnt_2	-0.1670	-0.1690	Standard
1342	Pnt_1	0.0390	0.0310	Special
1345	Pnt_1	-0.0060	0.0060	Standard
1352	Red_3	1.0050	1.1050	Standard
1356	Red_1	1.9830	0.9830	Standard
1358	Red_2	1.6670	1.0670	Standard
1361	Yel_1	2.4220	3.4220	Control
1364	Yel_2	1.7360	3.7360	Control
1371	Bare_3	-0.0310	-0.1310	Control
1372	Bare_1	-0.2300	-0.3200	Control
1373	Bare_3	-0.2380	-0.3380	Control
1406	Pnt_3	-0.2310	-0.1310	Standard
1414	Red_2	1.4090	1.0490	Standard
1416	Pnt_1	-0.1640	-0.1840	Standard
1416	Pnt_3	-0.1370	0.1370	Standard
1422	Pnt_3	-0.0950	-0.1950	Standard
1423	Red_1	1.0260	1.0360	Standard
1437	Bare_1	0.9350	0.9250	Special
1449	Red_3	1.0070	1.0370	Standard
1455	Pnt_2	0.0460	0.0430	Standard
1458	Pnt_1	0.1220	0.1120	Standard
1460	Yel_1	1.3040	2.3040	Control
1461	Yel_1	2.4000	3.4000	Control
1462	Red_3	-0.9850	0.9850	Control
1463	Yel_2	3.2980	3.2900	Control
1464	Yel_1	2.2250	3.2250	Control
1464	Bare_2	-0.2630	-0.2530	Control
1464	Bare_1	0.2290	-0.2290	Control

-------------------- XRF_ID = **MAP-3 L-shell (II) (continued)** ----------------

SAMPLE IDNO	READING	INCORRECT VALUE	CORRECT VALUE	DATA TYPE
1465	Red_1	-1.2640	1.2640	Control
1465	Red_2	0.1950	1.1950	Control
1465	Bare_1	-0.2270	0.2270	Control
1468	Bare_1	0.2530	-0.2530	Control
1513	Red_3	miss	1.2990	Standard
1514	Pnt_2	-0.0010	0.0010	Standard
1516	Red_3	1.1110	1.1610	Standard

1518	Pnt_1	-0.1260	-0.1360	Standard
1530	Red_2	1.3290	1.3490	Standard
1539	Bare_1	-0.9140	0.9140	Special
1545	Red_2	1.0570	1.0540	Standard
1561	Yel_2	2.4720	3.4720	Control
1562	Bare_1	-0.2300	-0.3300	Control
1568	Red_2	0.1300	1.1300	Control
1569	Red_2	1.2220	1.1220	Control
1571	Red_3	1.1930	1.1130	Control
1610	Red_3	1.2080	1.2800	Standard
1613	Bare_1	0.3990	-0.3990	Special
1623	Pnt_1	-0.0620	0.0620	Standard
1623	Pnt_3	-0.0430	0.0420	Standard
1625	Red_1	1.9430	0.9430	Standard
1635	Red_2	1.3480	1.1880	Standard
1639	Red_1	1.0950	1.1950	Special
1643	Pnt_2	-0.3270	0.3270	Standard
1650	Pnt_2	0.1170	-0.1170	Standard
1652	Pnt_1	-0.0140	0.0140	Standard
1652	Pnt_2	-0.4420	0.0420	Standard
1652	Pnt_1	-0.6000	-0.0600	Special
1656	Pnt_3	0.1540	-0.1540	Standard
1656	Red_2	-0.9940	0.9940	Standard
1657	Bare_1	-0.3090	-0.3010	Special
1660	Bare_2	0.0970	-0.0970	Control
1660	Yel_3	3.3300	3.3000	Control
1660	Bare_3	0.0880	-0.0880	Control
1661	Yel_1	2.2690	3.2690	Control
1663	Red_1	1.1000	1.1080	Control
1663	Red_2	1.1350	1.1530	Control
1663	Yel_3	2.4700	3.4700	Control
1664	Red_3	1.1870	1.1830	Control
1664	Yel_1	3.4120	3.4180	Control
1664	Red_3	-1.0440	1.0440	Control
1669	Yel_2	2.0490	3.0490	Control
1670	Yel_1	3.4850	3.4580	Control

-------------------- XRF_ID = **MAP-3 L-shell (II) (continued)** ----------------

SAMPLE IDNO	READING	INCORRECT VALUE	CORRECT VALUE	DATA TYPE
1706	Pnt_2	-0.0660	0.0660	Standard
1708	Pnt_1	-0.3700	-0.0370	Special
1719	Red_1	1.0500	1.0560	Standard
1721	Red_1	1.3510	1.3540	Standard
1725	Pnt_3	0.2650	-0.2650	Standard
1744	Pnt_2	-0.1500	-0.1580	Standard
1748	Pnt_1	0.0610	-0.0610	Standard
1750	Bare_1	-1.1270	-0.1270	Special
1763	Bare_1	0.1460	-0.1460	Control
1766	Bare_2	-0.1120	-0.1220	Control
1767	Red_1	0.9420	0.9720	Control
1812	Red_2	1.1380	1.1300	Standard
1822	Bare_1	0.2310	-0.2310	Special
1827	Red_1	1.1110	1.1130	Special

10.0 RECORDS WHICH CHANGED DUE TO DATA COMPARISONS (cont.)

1828	Pnt_2	-0.2820	-0.1420	Standard
1829	Pnt_3	-0.2700	-0.2710	Standard
1829	Red_3	1.3700	1.1370	Standard
1831	Pnt_3	-0.1120	-0.1220	Standard
1837	Red_1	1.3840	1.3040	Standard
1840	Red_2	1.8960	1.0960	Standard
1843	Red_1	1.1680	1.1600	Standard
1844	Pnt_2	0.0200	-0.0200	Standard
1846	Red_3	1.1660	1.1680	Standard
1847	Red_3	0.2800	0.9280	Standard
1858	Pnt_1	0.0390	-0.0390	Standard
1859	Pnt_1	0.1090	-0.1090	Special
1859	Red_1	0.1100	1.1100	Special
1861	Yel_1	2.5240	3.5240	Control
1861	Bare_1	-0.1950	-0.1940	Control
1863	Bare_2	-0.8940	-0.0940	Control
1863	Yel_1	2.1530	3.1530	Control
1863	Bare_3	-0.1880	-0.1080	Control
1865	Yel_2	1.7780	3.7780	Control
1865	Yel_3	3.3970	3.3570	Control
1867	Yel_2	2.3300	3.3300	Control
1867	Bare_1	0.3060	-0.3060	Control
1875	Red_1	1.0040	1.1040	Control
1909	Pnt_1	3.1110	0.1110	Standard
1911	Pnt_1	0.0830	0.0030	Standard
1914	Pnt_2	0.0720	-0.0720	Standard
1916	Pnt_2	-0.1780	0.0280	Standard
1917	Pnt_2	0.1630	-0.1630	Standard
1918	Pnt_2	-0.1080	-0.1000	Standard

-------------------- XRF_ID = **MAP-3 L-shell (II) (continued)** ----------------

SAMPLE IDNO	READING	INCORRECT VALUE	CORRECT VALUE	DATA TYPE
1934	Pnt_2	-0.1020	0.1020	Standard
1939	Red_3	0.9800	0.9080	Standard
1940	Pnt_1	-0.1740	-0.0740	Standard
1940	Red_1	1.9210	0.9210	Standard
1943	Pnt_2	-0.2270	-0.1270	Standard
1944	Pnt_1	-0.2750	-0.2710	Standard
1949	Red_1	0.9940	0.9440	Standard
1958	Pnt_3	0.1130	-0.1130	Standard
1960	Yel_2	2.0900	3.0900	Control
1963	Yel_3	3.2840	3.2480	Control
1970	Bare_2	0.1490	-0.1490	Control
1971	Yel_1	3.9040	2.9040	Control
1975	Yel_2	1.1620	3.1620	Control

----------------------- XRF_ID = **Pb Analyzer K-shell** -----------------------

SAMPLE IDNO	READING	INCORRECT VALUE	CORRECT VALUE	DATA TYPE

10.0 RECORDS WHICH CHANGED DUE TO DATA COMPARISONS (cont.)

61	Time	miss	11:49	Standard
62	Time	miss	11:58	Standard
63	Time	miss	12:01	Standard
64	Time	miss	12:04	Standard
65	Time	miss	12:07	Standard
66	Time	miss	12:11	Standard
67	Time	miss	12:15	Standard
68	Time	miss	12:18	Standard
69	Time	miss	12:23	Standard
70	Time	miss	12:26	Standard
71	Time	miss	12:29	Standard
72	Time	miss	12:32	Standard
73	Time	miss	12:37	Standard
74	Time	miss	12:41	Standard
75	Time	miss	12:45	Standard
256	Pnt_3	0.0200	0.2000	Standard
272	Red_2	1.1000	1.2000	Standard
330	Pnt_3	-0.2000	0.2000	Standard
383	Bare_2	0.1100	-0.1200	Control
485	Red_3	1.0700	0.7000	Control

------------------ XRF_ID = **Pb Analyzer K-shell (continued)** -----------------

SAMPLE IDNO	READING	INCORRECT VALUE	CORRECT VALUE	DATA TYPE
485	Bare_2	-1.3000	-0.1400	Control
866	Red_1	1.1000	1.0000	Standard
882	Bare_2	0.0200	0.2000	Control
945	Red_3	1.0200	1.2000	Standard
993	Bare_3	-0.0800	0.0800	Control
1205	Pnt_1	0.3000	0.0347	Standard
1207	Bare_1	0.2000	-0.1580	Standard
1211	Pnt_1	5.7000	4.9670	Standard
1217	Pnt_2	-0.7000	-0.0657	Standard
1217	Pnt_3	0.4000	0.0433	Standard
1247	Red_2	0.2000	1.1874	Standard
1276	Bare_3	-0.0300	0.0311	Control
1319	Red_1	0.1000	0.9184	Standard
1323	Pnt_2	0.1400	-0.1356	Standard
1360	Bare_2	-0.0200	-0.2006	Control
1454	Pnt_3	2.8000	2.2695	Standard
1457	Pnt_3	1.8000	0.8121	Standard
1459	Red_2	1.3000	1.1515	Standard
1462	Bare_1	0.0900	-0.0857	Control
1476	Bare_2	0.3000	0.0278	Control
1550	Red_3	1.8000	0.8482	Standard
1559	Time	13:20	13:25	Standard
1571	Bare_3	-0.0200	-0.1843	Control
1623	Bare_3	0.1400	-0.1400	Standard
1639	Red_3	1.2000	1.0837	Standard
1639	Bare_1	0.0200	0.1167	Standard
1660	Bare_2	-0.0100	-0.0115	Control

10.0 RECORDS WHICH CHANGED DUE TO DATA COMPARISONS (cont.)

1664	Bare_1	0.0900	-0.0870	Control
1670	Red_1	1.1000	1.0000	Control
1673	Bare_3	-0.0200	-0.1700	Control
1724	Bare_2	0.2500	0.1967	Standard
1734	Red_3	0.6000	1.5715	Standard
1740	Pnt_3	0.6000	0.5123	Standard
1750	Bare_3	0.0700	-0.0748	Standard
1757	Red_1	1.2000	1.0122	Standard
1761	Bare_3	-0.0900	-0.0393	Control
1774	Bare_1	-0.8000	-0.0773	Control
1823	Pnt_3	0.5000	0.1668	Standard
1837	Red_3	0.1000	0.9950	Standard
1838	Bare_1	0.9000	0.0915	Standard
1851	Pnt_2	0.8000	0.0785	Standard
1860	Bare_1	-0.0500	-0.4593	Control
1860	Bare_3	-0.0300	-0.2852	Control

----------------- XRF_ID = **Pb Analyzer K-shell (continued)** -----------------

SAMPLE IDNO	READING	INCORRECT VALUE	CORRECT VALUE	DATA TYPE
1865	Bare_2	-0.1400	-0.0369	Control
1914	Pnt_2	0.2300	0.2857	Standard
1920	Bare_2	0.0900	-0.0892	Standard
1929	Pnt_3	-0.2600	-0.1584	Standard
1935	Red_1	1.9000	0.9466	Standard
1936	Pnt_2	2.1000	2.0086	Standard
1936	Red_3	0.9800	0.9163	Standard
1942	Time	11:37	13:37	Standard
1949	Time	13:06	14:06	Standard
1950	Time	13:11	14:11	Standard
1951	Time	13:14	14:14	Standard
1960	Bare_1	-0.0400	-0.3675	Control
1965	Bare_3	-0.0110	-0.1081	Control
1969	Bare_3	0.1900	-0.1913	Control

----------------------- XRF_ID = **Pb Analyzer L-shell** -----------------------

SAMPLE IDNO	READING	INCORRECT VALUE	CORRECT VALUE	DATA TYPE
61	Time	miss	11:49	Standard
62	Time	miss	11:58	Standard
63	Time	miss	12:01	Standard
64	Time	miss	12:04	Standard
65	Time	miss	12:07	Standard
66	Time	miss	12:11	Standard
67	Time	miss	12:15	Standard
68	Time	miss	12:18	Standard
69	Time	miss	12:23	Standard
70	Time	miss	12:26	Standard
71	Time	miss	12:29	Standard

10.0 RECORDS WHICH CHANGED DUE TO DATA COMPARISONS (cont.)

72	Time	miss	12:32	Standard
73	Time	miss	12:37	Standard
74	Time	miss	12:41	Standard
75	Time	miss	12:45	Standard
408	Pnt_3	0.2600	0.0260	Standard
478	Pnt_3	0.1600	0.0160	Standard
489	Bare_1	0.0400	-0.0410	Control
534	Red_3	1.0900	1.0200	Standard
605	Pnt_1	0.7600	0.0760	Standard
605	Pnt_3	0.7900	0.0790	Standard

------------------ XRF_ID = **Pb Analyzer L-shell (continued)** -----------------

SAMPLE IDNO	READING	INCORRECT VALUE	CORRECT VALUE	DATA TYPE
709	Pnt_3	0.0290	0.2900	Standard
1333	Pnt_3	0.0107	0.1073	Standard
1336	Red_1	1.8000	1.0752	Standard
1426	Red_1	0.0400	1.0367	Standard
1428	Red_1	0.0100	1.0100	Standard
1428	Bare_1	1.0150	0.0150	Standard
1428	Bare_2	1.0140	0.0140	Standard
1458	Pnt_1	0.9900	0.0989	Standard
1458	Pnt_2	0.9100	0.0909	Standard
1460	Bare_1	1.0070	0.0071	Control
1505	Red_1	0.0800	1.0832	Standard
1545	Pnt_2	0.0090	0.0890	Standard
1554	Red_1	1.0000	1.1020	Standard
1558	Time	13:21	13:21	Standard
1559	Time	13:20	13:25	Standard
1560	Bare_2	0.1000	0.0098	Control
1565	Bare_2	0.0800	0.0177	Control
1626	Red_1	0.0730	0.7300	Standard
1750	Pnt_2	0.6500	0.0646	Standard
1757	Red_2	0.7700	0.9879	Standard
1808	Red_2	0.9300	0.9842	Standard
1839	Pnt_1	0.1800	0.0183	Standard
1942	Time	11:37	13:37	Standard
1949	Time	13:06	14:06	Standard
1950	Time	13:11	14:11	Standard
1951	Time	13:14	14:14	Standard

11.0 RECORDS FLAGGED FOR OMISSION

A small percentage of records were flagged for easy identification for omission from the primary data analyses. These records were flagged due to various data collection problems or departures from the data collection protocol or because the data were ancillary to the study. Most of these data were re-collected whenever it was possible to do so in the field.
This section provides a description of these flagged records. It was not desirable to permanently delete these records, so the omission flag was established to identify these records. All of records with the omission flag set are documented below with the reason for its omission. Refer to the descriptions of the data sets to interpret the meaning of any codes presented below.

Records were identified for omission using the OMIT variable. The OMIT variable is used in the TEST_KIT, XRF_NORM, XRF_CTRL, and LAB_ICP data sets and is described in the sections for each of these data sets. When a record has the OMIT variable set equal to '*', the record was omitted from the primary analysis data sets. This flag would be set if, for example, an XRF measurement was interrupted due to a power failure. Most likely, a replacement measurement would have been taken once power was restored. The first measurement would be flagged for omission with a "*" while the second measurement would not be flagged and would be used for analyses.

Note that among the list of records flagged for omission from the LAB_ICP data set are records that were part of a preliminary analysis used to determine the optimal sample weight. The data from these records were used in preliminary laboratory analyses, but not for primary study analyses. Further note that there are records flagged for omission because they were analyzed only as a follow-up analysis to examine low NIST SRM recovery rates. For a detailed discussion about these analyses, see section 4.4.2.2.1 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report*.

In the list of records flagged for omission from the TEST_KIT data set are records with data obtained while using a testing solution that was suspect. The suspect results were re-taken and now replace the records flagged for omission. For a discussion about the use of the suspect testing solution, see section 3.4.4.2.2 of *A Field Test of Lead-Based Paint Testing Technologies: Technical Report*.

11.0 RECORDS FLAGGED FOR OMISSION (cont.)

Finally, note that records of XRF readings flagged for omission contain readings which were prematurely interrupted or were taken using procedures that were departures from the data collection protocols. Most of the readings were retaken whenever it was possible to do so in the field.

Below are lists that provide information for identifying records flagged for omission from the LAB_ICP, TEST_KIT, XRF_NORM, and XRF_CTRL data sets. A separate list is provided for each data set. In the lists are variables sufficient to uniquely identify a record when used in conjunction with the OMIT flag. Descriptions and definitions of identifying variables are given in preceding sections. The lists also provide reasons for the omission flag.

LAB_ICP Data Set

IDNO	RUN_NO	BATCH	REASON FOR OMISSION FLAG
905545	31	601	Sample used for preliminary analysis.
905545	32	601	Sample used for preliminary analysis.
905564	33	601	Sample used for preliminary analysis.
905564	34	601	Sample used for preliminary analysis.
905541	35	601	Sample used for preliminary analysis.
905541	41	601	Sample used for preliminary analysis.
905533	44	601	Sample used for preliminary analysis.
905533	45	601	Sample used for preliminary analysis.
905533	46	601	Negative bias; some sample was lost during digestion.
905597	48	601	Sample used for preliminary analysis.
905597	49	601	Sample used for preliminary analysis.
905592	50	601	Sample used for preliminary analysis.
905592	59	601	Sample used for preliminary analysis.
905604	60	601	Sample used for preliminary analysis.
905604	61	601	Sample used for preliminary analysis.
905524	64	601	Sample used for preliminary analysis.
905524	65	601	Sample used for preliminary analysis.
905605	68	601	Sample used for preliminary analysis.
905605	73	601	Sample used for preliminary analysis.
905591	81	601	Sample used for preliminary analysis.
905501	82	601	Sample used for preliminary analysis.
905591	82	601	Sample used for preliminary analysis.
905501	90	601	Sample used for preliminary analysis.
905593	93	601	Sample used for preliminary analysis.
905593	94	601	Sample used for preliminary analysis.
905507	97	601	Sample used for preliminary analysis.
905507	98	601	Sample used for preliminary analysis.
905527	106	601	Sample used for preliminary analysis.

LAB_ICP Data Set (continued)

11.0 RECORDS FLAGGED FOR OMISSION (cont.)

IDNO	RUN_NO	BATCH	REASON FOR OMISSION FLAG
905527	107	601	Sample used for preliminary analysis.
905528	109	601	Sample used for preliminary analysis.
905528	110	601	Sample used for preliminary analysis.
905587	128	601	Sample used for preliminary analysis.
905587	129	601	Sample used for preliminary analysis.
905531	137	601	Sample used for preliminary analysis.
905531	138	601	Sample used for preliminary analysis.
905521	141	601	Sample used for preliminary analysis.
905521	142	601	Sample used for preliminary analysis.
905523	160	601	Sample used for preliminary analysis.
905523	161	601	Sample used for preliminary analysis.
905590	168	601	Sample contained material which would not homogenize.
905590	169	601	Sample contained material which would not homogenize.
905605	157	602	Extra sample.
905600	66	603	Extra sample.
905560	90	603	Improperly collected.
905503	28	604	Re-prepped and replaced.
905504	29	604	Re-prepped and replaced.
905510	34	604	Sample may be biased low by 20%.
905513	42	604	Sample may be biased low by 20%.
905525	48	604	Re-prepped and replaced.
905532	62	604	Sample may be biased low by 20%.
905534	63	604	Re-prepped and replaced.
905560	74	604	Sample may be biased low by 20%.
905561	75	604	Re-prepped and replaced.
905535	108	605	Sample missing collection area dimensions.
905535	109	605	Sample missing collection area dimensions.
905542	110	605	Extra sample.
905600	228	605	Extra sample.
80540	99	713	Extra sample.
80667	113	721	Extra sample.
81812	91	723	Sample replaced due to follow-up analysis.
81812	92	723	Sample replaced due to follow-up analysis.
81425	61	725	Sample replaced due to follow-up analysis.
81425	62	725	Sample replaced due to follow-up analysis.
81358	45	727	Replaced by another field sample.
81607	48	729	Sample replaced due to follow-up analysis.
81607	49	729	Sample replaced due to follow-up analysis.
81955	172	730	Replaced by another field sample.
81255	113	733	Sample replaced due to follow-up analysis.
81255	114	733	Sample replaced due to follow-up analysis.
81257	124	733	Replaced by another field sample.
81258	125	733	Replaced by another field sample.
81213	32	734	Sample used for follow-up analysis.
81307	42	734	Sample used for follow-up analysis.
81318	43	734	Sample used for follow-up analysis.
81335	44	734	Sample used for follow-up analysis.
81409	49	734	Sample used for follow-up analysis.
81510	62	734	Sample used for follow-up analysis.
81557	63	734	Sample used for follow-up analysis.
81643	67	734	Sample used for follow-up analysis.
81646	73	734	Sample used for follow-up analysis.

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LAB_ICP Data Set (continued)

IDNO	RUN_NO	BATCH	REASON FOR OMISSION FLAG
81654	75	734	Sample used for follow-up analysis
81736	77	734	Sample used for follow-up analysis.
81745	78	734	Sample used for follow-up analysis.
81806	79	734	Extra sample.
81839	91	734	Sample used for follow-up analysis.
81846	92	734	Sample used for follow-up analysis.

11.0 RECORDS FLAGGED FOR OMISSION (cont.)

81910	93	734	Sample used for follow-up analysis.
81916	94	734	Replaced.
81920	96	734	Sample used for follow-up analysis.
81341	25	999	Sample used for follow-up analysis.
81344	26	999	Sample used for follow-up analysis.
81345	27	999	Sample used for follow-up analysis.
81347	28	999	Sample used for follow-up analysis.
81410	29	999	Sample used for follow-up analysis.
81411	30	999	Sample used for follow-up analysis.
81412	31	999	Sample used for follow-up analysis.
81413	32	999	Sample used for follow-up analysis.
81414	33	999	Sample used for follow-up analysis.
81449	34	999	Sample used for follow-up analysis.
81534	66	999	Sample used for follow-up analysis.
81536	67	999	Sample used for follow-up analysis.
81537	73	999	Sample used for follow-up analysis.
81539	74	999	Sample used for follow-up analysis.
81820	75	999	Sample used for follow-up analysis.
81824	76	999	Sample used for follow-up analysis.
81827	77	999	Sample used for follow-up analysis.
905523	78	999	Sample used for follow-up analysis.
905524	79	999	Sample used for follow-up analysis.
905531	80	999	Sample used for follow-up analysis.
905533	81	999	Sample used for follow-up analysis.
905541	91	999	Sample used for follow-up analysis.
905586	92	999	Sample used for follow-up analysis.
905592	93	999	Sample used for follow-up analysis.
905593	94	999	Sample used for follow-up analysis.
905596	95	999	Sample used for follow-up analysis.
905596	96	999	Sample used for follow-up analysis.
905597	97	999	Sample used for follow-up analysis.
905604	98	999	Sample used for follow-up analysis.
905606	99	999	Sample used for follow-up analysis.
905607	100	999	Sample used for follow-up analysis.

TEST_KIT Data Set

IDNO	DATE	TEST KIT	REASON FOR OMISSION FLAG
80537	07/23/93	LeadCheck	Incorrect substrate; retested location.
81327	09/21/93	LeadCheck	Location changed and retested.
81332	09/20/93	LeadCheck	Location changed and retested.

TEST_KIT Data Set (cont.)

IDNO	DATE	TEST KIT	REASON FOR OMISSION FLAG
80405	07/26/93	Lead Alert: Sanding	Incorrect testing solution.
80406	07/26/93	Lead Alert: Sanding	Incorrect testing solution.
80407	07/26/93	Lead Alert: Sanding	Incorrect testing solution.
80408	07/26/93	Lead Alert: Sanding	Incorrect testing solution.
80409	07/24/93	Lead Alert: Sanding	Incorrect testing solution.
80410	07/24/93	Lead Alert: Sanding	Incorrect testing solution.
80415	07/26/93	Lead Alert: Sanding	Incorrect testing solution.
80416	07/26/93	Lead Alert: Sanding	Incorrect testing solution.
80420	07/24/93	Lead Alert: Sanding	Incorrect testing solution.
80428	07/24/93	Lead Alert: Sanding	Incorrect testing solution.
80429	07/24/93	Lead Alert: Sanding	Incorrect testing solution.
80434	07/24/93	Lead Alert: Sanding	Incorrect testing solution.
80435	07/24/93	Lead Alert: Sanding	Incorrect testing solution.

11.0 RECORDS FLAGGED FOR OMISSION (cont.)

80438	07/26/93	Lead Alert: Sanding	Incorrect testing solution.
80440	07/24/93	Lead Alert: Sanding	Incorrect testing solution.
80443	07/26/93	Lead Alert: Sanding	Incorrect testing solution.
80444	07/26/93	Lead Alert: Sanding	Incorrect testing solution.
80445	07/24/93	Lead Alert: Sanding	Incorrect testing solution.
80446	07/26/93	Lead Alert: Sanding	Incorrect testing solution.
80449	07/26/93	Lead Alert: Sanding	Incorrect testing solution.
80449	07/24/93	Lead Alert: Sanding	Incorrect testing solution.
80450	07/26/93	Lead Alert: Sanding	Incorrect testing solution.
80451	07/24/93	Lead Alert: Sanding	Incorrect testing solution.
80453	07/24/93	Lead Alert: Sanding	Incorrect testing solution.
80455	07/24/93	Lead Alert: Sanding	Incorrect testing solution.
80456	07/24/93	Lead Alert: Sanding	Incorrect testing solution.
80457	07/24/93	Lead Alert: Sanding	Incorrect testing solution.
80458	07/26/93	Lead Alert: Sanding	Incorrect testing solution.
80459	07/26/93	Lead Alert: Sanding	Incorrect testing solution.
80460	07/26/93	Lead Alert: Sanding	Incorrect testing solution.
80461	07/26/93	Lead Alert: Sanding	Incorrect testing solution.
80464	07/24/93	Lead Alert: Sanding	Incorrect testing solution.
80465	07/24/93	Lead Alert: Sanding	Incorrect testing solution.
80466	07/26/93	Lead Alert: Sanding	Incorrect testing solution.
80467	07/26/93	Lead Alert: Sanding	Incorrect testing solution.
80468	07/26/93	Lead Alert: Sanding	Incorrect testing solution.
80469	07/26/93	Lead Alert: Sanding	Incorrect testing solution.
80473	07/24/93	Lead Alert: Sanding	Incorrect testing solution.
80474	07/26/93	Lead Alert: Sanding	Incorrect testing solution.
80475	07/24/93	Lead Alert: Sanding	Incorrect testing solution.
80477	07/26/93	Lead Alert: Sanding	Incorrect testing solution.
80163	07/17/93	Lead Zone	Duplicate test at same location.
81327	09/17/93	Lead Zone	Location changed and retested.
81332	09/17/93	Lead Zone	Location changed and retested.
81327	09/21/93	Lead Alert: Coring	Location changed and retested.
81332	09/21/93	Lead Alert: Coring	Location changed and retested.
80156	07/19/93	Lead Detective	Duplicate test at same location.
80920	08/02/93	Lead Detective	Duplicate test at same location.
81327	09/20/93	Lead Detective	Location changed and retested.

TEST_KIT Data Set (cont.)

IDNO	DATE	TEST KIT	REASON FOR OMISSION FLAG
81332	09/20/93	Lead Detective	Location changed and retested.
80537	07/23/93	State Sodium Sulfide	Incorrect location, retested.
80971	07/31/93	State Sodium Sulfide	Duplicate test at same location.
81327	09/17/93	State Sodium Sulfide	Location changed and retested.
81332	09/17/93	State Sodium Sulfide	Location changed and retested.

XRF_NORM Data Set

IDNO	XRF_ID	TIME	PNT_1	REASON FOR OMISSION FLAG
81612	Pb Analyzer K-shell	10:34	0.300	Interrupted for electronic data transfer.
81911	Pb Analyzer K-shell	9:14	3.400	Analyzer malfunction, wouldn't count down.
81612	Pb Analyzer L-shell	10:34	0.107	Interrupted for electronic transfer.
81911	Pb Analyzer L-shell	9:14	0.112	Analyzer malfunction, wouldn't count down.
80066	MAP-3 K-shell (I)	9:45	-0.720	Reading taken outside of protocol.
80071	MAP-3 K-shell (I)	9:59	0.924	Reading taken outside of protocol.

11.0 RECORDS FLAGGED FOR OMISSION (cont.)

80066	MAP-3 L-shell (I)	9:45	-0.141	Reading taken outside of protocol.
80071	MAP-3 L-shell (I)	9:59	0.507	Reading taken outside of protocol.
80528	MAP-3 K-shell (II)	13:20	-0.069	Reading taken outside of protocol.
80528	MAP-3 L-shell (II)	13:20	0.257	Reading taken outside of protocol.
80405	XL prototype	8:56	0.300	Machine reset several times; retested.
80406	XL prototype	8:59	0.000	Machine reset several times; retested.
80407	XL prototype	9:02	0.100	Machine reset several times; retested.
80408	XL prototype	9:05	0.100	Machine reset several times; retested.
80409	XL prototype	9:07	0.500	Machine reset several times; retested.
80410	XL prototype	9:11	0.100	Machine reset several times; retested.

11.0 RECORDS FLAGGED FOR OMISSION (cont.)

XRF_CTRL Data Set

IDNO	DATE	XRF ID	SUB	TYPE	TIME	REASON FOR OMISSION FLAG
	08/13/93	Pb Analyzer K-shell	D		14:10	Incorrect substrate.
81466	10/15/93	Pb Analyzer K-shell	C	1	8:27	Incorrect substrate order.
	08/13/93	Pb Analyzer L-shell	D		14:10	Incorrect substrate.
81466	10/15/93	Pb Analyzer L-shell	C	1	8:27	Incorrect substrate order.
80486	08/09/93	MAP-3 K-shell (II)	P	1	8:37	Departure from protocol.
80486	08/09/93	MAP-3 L-shell (II)	P	1	8:37	Departure protocol.
80280	08/12/93	ML I (II)	M	3	12:34	Interrupted by power failure.
	08/05/93	X-MET 880	B		9:31	Wrong substrate model used.
	08/05/93	X-MET 880	D		9:37	Wrong substrate model used.
	08/05/93	X-MET 880	C		9:42	Wrong substrate model used.
	08/05/93	X-MET 880	P		9:47	Wrong substrate model used.
	08/15/93	X-MET 880	D	1	9:52	Wrong substrate model used.
	08/06/93	X-MET 880	M	1	10:30	Count rate too high.
81574	10/12/93	XK-3 (I)	W	1	14:23	Wrong substrate order.
80894	08/06/93	XK-3 (II)	D	1	16:00	Departure from protocol.
80480	08/16/93	XL prototype	M	2	8:26	Machine reset; retested.
80481	08/16/93	XL prototype	W	2	8:29	Machine reset; retested.
80482	08/16/93	XL prototype	B	2	8:32	Machine reset; retested.
80483	08/16/93	XL prototype	D	2	8:36	Machine reset; retested.
80484	08/16/93	XL prototype	C	2	8:40	Machine reset; retested.
80485	08/16/93	XL prototype	P	2	8:44	Machine reset; retested.
80486	08/16/93	XL prototype	M	1	8:49	Machine reset; retested.
80487	08/16/93	XL prototype	M	1	9:15	Machine reset; retested.
80488	08/16/93	XL prototype	M	1	9:20	Machine reset; retested.

12.0 ERRATA

This section contains corrections for errata identified in the report *A Field Test of Lead-Based Paint Testing Technologies: Technical Report*. The description of each omission or error is underlined; the correction is in bold face type following the description.

1. Beginning on page 6-341, the following passage is incorrect: "<u>For example, there are 31 error rates exceeding 10%; of these, only two were reduced below 10% by use of the average, and both improvements were small (11.1% versus 10.2% false negative rates for the Lead Analyzer K-shell on concrete and 7.4% versus 6.8% false negative rates for the Microlead I on plaster).</u>"

   The correct wording for this passage is: "**For example, there are 36 error rates exceeding 10%; of these, only two were reduced below 10% by use of the average, and both improvements were small (11.1 % versus 7.4% false negative rates for the Lead Analyzer K-shell on concrete and 10.2% versus 6.8% false negative rates for the Microlead I on plaster).**"

2. In Section 4, the page numbering is incorrect for the series of pages numbered 4-35, 4-34, 4-35, and all the subsequent pages in section 4 after this series of pages.

   The series of pages in the text numbered 4-35, 4-34, 4-35 should be numbered 4-35, 4-36, 4-37. All subsequent pages in section 4 should be incremented by 2 to be correctly numbered. Hence the current page 4-36 in the text becomes 4-38, page 4-37 becomes page 4-39, and so on for the remainder of section 4.

3. The notes at the bottom of Table 4-17 (beginning on the current page 4-54 in the text) include the equation <u>RATIO2 = AREA1 ÷ AREA2</u>. This equation is incorrect.

   The correct equation is: **RATIO2 = AREA2 ÷ AREA1**. (The data in Table 4-17 were computed correctly, and no change is necessary other than correcting the equation in the text).

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12.0 ERRATA (cont.)

4. The notes at the bottom of Table 4-18 (beginning on the current page 4-59 in the text) include the equation RATIO2 = PERCENT1 ÷ PERCENT2. This equation is incorrect.

   The correct equation is: **RATIO2 = PERCENT2 ÷ PERCENT1**. (The data in Table 4-18 were computed correctly, and no change is necessary other than correcting the equation in the text).

5. A page of data is missing in Table 4-17. There should be another page of data between the current pages 4-54 and 4-55 in the text. **The following table of data should be inserted between the data on the current pages 4-54 and 4-55 in the text**.

SAMPLE ID	AREA1	AREA2	SUBSTRATE	CITY	LOG(AREA1)	LOG(AREA2)	RATIO1	RATIO2
81256	0.2627	0.2479	Plaster	Philadelphia	-1.33682	-1.39473	1.05962	0.94373
80421	0.0265	0.0281	Wood	Denver	-3.63174	-3.57270	1.06082	1.06082
905594	0.1019	0.0960	Plaster	Louisville	-2.28412	-2.34388	1.06157	0.94200
905543	0.0042	0.0040	Metal	Louisville	-5.46894	-5.52956	1.06250	0.94118
81824	0.2982	0.2799	Plaster	Philadelphia	-1.21006	-1.27343	1.06542	0.93859
905508	5.3777	5.0434	Wood	Louisville	1.68226	1.61809	1.06628	0.93784
905511	10.2236	9.5797	Wood	Louisville	2.32469	2.25964	1.06721	0.93702
80706	2.0836	2.2249	Metal	Denver	0.73409	0.79970	1.06781	1.06781
905593	0.1269	0.1359	Plaster	Louisville	-2.06436	-1.99595	1.07081	1.07081
80375	0.0021	0.0023	Plaster	Denver	-6.16582	-6.09683	1.07143	1.07143
905545	0.4320	0.4024	Metal	Louisville	-0.83927	-0.91027	1.07358	0.93147
80612	0.0013	0.0014	Metal	Denver	-6.63773	-6.56417	1.07634	1.07634
905550	0.6764	0.7285	Metal	Louisville	-0.39094	-0.31675	1.07702	1.07702
81731	0.5362	0.5795	Concrete	Philadelphia	-0.62319	-0.54564	1.08064	1.08064
905570	0.1341	0.1239	Wood	Louisville	-2.00913	-2.08855	1.08266	0.92365
905564	14.0468	15.2450	Wood	Louisville	2.64239	2.72425	1.08530	1.08530
81833	0.2160	0.1990	Plaster	Philadelphia	-1.53266	-1.61460	1.08539	0.92133
905531	0.2561	0.2780	Concrete	Louisville	-1.36233	-1.28014	1.08566	1.08566
80529	0.0177	0.0163	Wood	Denver	-4.03589	-4.11905	1.08672	0.92020
81752	0.5324	0.5789	Plaster	Philadelphia	-0.63030	-0.54656	1.08735	1.08735
80323	0.0099	0.0108	Wood	Denver	-4.61826	-4.53285	1.08916	1.08916
905514	0.2103	0.1930	Wood	Louisville	-1.55943	-1.64517	1.08953	0.91783
81945	0.1976	0.1813	Metal	Philadelphia	-1.62136	-1.70771	1.09019	0.91727
80778	7.4628	6.8423	Plaster	Denver	2.00993	1.92313	1.09068	0.91686
905506	11.2622	12.2941	Wood	Louisville	2.42145	2.50912	1.09163	1.09163
905521	3.7888	4.1370	Plaster	Louisville	1.33206	1.41998	1.09190	1.09190
81427	0.6456	0.5907	Plaster	Philadelphia	-0.43756	-0.52640	1.09290	0.91500
905516	2.4268	2.6531	Wood	Louisville	0.88659	0.97571	1.09322	1.09322
905529	0.3228	0.3537	Plaster	Louisville	-1.13066	-1.03924	1.09572	1.09572
80444	0.1031	0.1130	Wood	Denver	-2.27167	-2.18019	1.09579	1.09579
80219	0.0681	0.0622	Wood	Denver	-2.68648	-2.77820	1.09606	0.91236
905580	0.0010	0.0009	Drywall	Louisville	-6.90114	-6.99464	1.09800	0.91074
905509	0.1567	0.1425	Wood	Louisville	-1.85346	-1.94829	1.09948	0.90952
80915	0.0588	0.0534	Brick	Denver	-2.83429	-2.92957	1.09996	0.90912
80071	1.3858	1.2537	Plaster	Denver	0.32626	0.22611	1.10534	0.90470

13.0 REFERENCES

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